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# PRECISE LEVELLING.

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## PRECISE LEVELLING.

This publication is the sixth of the "Publications of the Dominion Observatory" on the subject of precise levelling by the Geodetic Survey of Canada, the ones previously issued being as follows:—

Vol. I, No. 2,	issued in 1913*
Vol. I, No. 3,	" 1913
Vol. I, No. 8,	" 1914
Vol. II, No. 1,	" 1915
Vol. III, No. 6,	" 1916

Previous to the above a set of results was published as an appendix to the Chief Astronomer's report for the year 1910; these results have now been revised and are reprinted in standard form in this issue.

The present publication is arranged in the same general form as the previous ones, the results of the levelling being set forth in three tables; each table, however, has been subdivided into two sections, the first section containing work now published for the first time and the second containing the reprint of the work published in 1910. The index and map included herein are complete for all the work previously published, as well as that in the present publication; the index indicates in which publication descriptions and elevations of bench-marks published before this may be found.

Tables I and I-A indicate the routes followed between terminal points and give complete descriptions of all bench-marks established along these routes.

Tables II and II-A show in the first two columns the numbers of the bench-marks; in the third and fourth columns the approximate distance (in miles) between bench-marks, and from the initial bench-mark of the line; the fifth and sixth columns (headed "Discrepancy") give the difference (in feet) between the forward levelling and the backward levelling for each section between bench-marks and the accumulated difference from the

\*Levelling in Yukon territory only.

initial bench-mark. The seventh column gives the elevations of the bench-marks shown in the second column; for convenience, these bench-marks are repeated (in the eighth column) in order that the number of any bench-mark and its elevation may be in adjoining columns. In these tables are shown also the elevations determined by the Geodetic Survey for certain bench-marks established by other surveys and connected with our levelling.

Tables III and III-A show the elevations at railway stations and at crossings of intersecting railways; also on the bridges over rivers and lakes and the more important streams. Rail elevations were in all cases taken on top of the rail, in front of the telegraph office at telegraph stations and opposite the shelter or platform at flag-stations.

The results are given (in Tables I, II and III) for the following lines of new levelling:—

1. St. Anselme, Que., to Edmundston, N.B.
2. Harlaka Jet. to Rivière-du-Loup, Que., with branch to Bretagne.
3. Ottawa to Renfrew, Ont.
4. Kempton to Ivanhoe, Ont., with branches to Carleton Place, Brockville, Renfrew, Kingston and Belleville.
5. Steelton to Franz, Ont., with branch to Michipicoten.
6. Kipp, Alta., to Golden, B.C.
7. Bull River to Kootenay Landing, B.C.
8. Field to Revelstoke, B.C.
9. Edmonton to Jasper, Alta.

Results for the following lines are reprinted (in Tables I-A, II-A and III-A):—

- a. St. Stephen, N.B., to Rivière-du-Loup, Que.
- b. Brunswick to St. John, N.B.
- c. Rouse Point, N.Y., to Sherbrooke, Que.
- d. Farnham to St. Armand, Que.
- e. Foster to Abercorn, Que.
- f. Sherbrooke, Que., to Norton Mills, Vt.
- g. Rouse Point, N.Y., to Colborne, Ont.

Lines 1 and 2 were started from the Megantic-Levis line (1913 publication) and closed upon the St. Stephen-Rivière-du-Loup line at Edmundston and Rivière-du-Loup respectively; the new elevations are at the former place 0.102 foot and at the latter 0.432 foot lower than those formerly carried from St. Stephen. The large circuit—St. Anselme-Edmundston-Rivière-du-Loup-Harlaka Jet.—is divided by the cross-country line from St. Philippe-de-Neri to Bretagne, the closing errors of the two smaller circuits thus formed being 0.087 and 0.243 foot. The levelling along line 2 has been connected with a large number of bench-marks established by the Public Works Department of Canada; these bench-marks are designated by Roman numerals. For their descriptions the reader is referred to that department. Table II in the present publication gives their elevations as determined by the Geodetic Survey.

Line 3 forms the closing link in a large circuit of levels extending through Renfrew, Depot Harbour, Toronto, Prescott and Ottawa. The closing error of the circuit is 0.196 foot—the difference between the two elevations for the junction bench-mark at Renfrew. Line 4 was started from the Rouse Point-Toronto line; five subsidiary lines branch north and south from it, each terminating at a point on the circumference of the large circuit referred to in connection with line 3. The five small circuits thus formed at the easterly end of the main circuit have closures varying from 0.028 to 0.162 foot.

Line 5 commences at bench-mark 634 on the Sudbury-Sault Ste. Marie line (1916 publication). In Table II connections are shown with three bench-marks of the United States Lake Survey; two of these appeared in last year's publication, but owing to incorrect information the elevation there given for "P.B.M.—B." was in error. At Michipicoten a connection was made with a bench-mark of the Hydrographic Survey, Department of the Naval Service; the elevation of this, derived by water transfers during the years 1915 and 1916, between automatic gauges at Michipicoten and Port Arthur is 626.352; the elevation obtained by us by our line of precise levels from Rouse Point, N.Y., via Toronto, Sudbury, etc., is 625.079.



Line 6 commences at bench-mark 81-D on the Lethbridge-Calgary line (1915 publication); line 7 is a branch from line 6 and is connected at Port-hill, Idaho, with a bench-mark of the United States Coast and Geodetic Survey. At Golden, B.C., line 6 is closed upon line 8—a continuation of the Calgary-Field line (1916 publication). The closing error of the 623-mile circuit, Calgary-Kipp-Bull River-Golden, is 0.115 foot. Line 9 is a continuation of the Saskatoon-Wainwright-Edmonton line (1915 and 1916 publications).

The elevations along lines *a* and *b* are based, as formerly, upon a provisional datum at St. Stephen, N.B., established by United States engineers; these elevations have now been checked by precise level connections with the Naval Service Department's tide-gauge at Halifax and with the United States Coast and Geodetic Survey bench-mark at Rouse Point, N.Y. The differences are comparatively small—see last year's publication and also lines 1 and 2 of the present publication—consequently it has been considered better to adhere to the originally published figures until such time as more permanent values may be fixed by means of a proper adjustment of the levels.

Line *c* and the branch lines *d*, *e* and *f* are based upon the Coast and Geodetic Survey bench-mark at Rouse Point, N.Y. Line *g* was also started from this bench-mark; regarding the elevations along line *g*, attention is called to the fact that the originally published elevations of all bench-marks between and including Nos. 124 and 145 have been lowered by one foot, this being due to errors in the field work which were detected only recently. At Kingston the Hydrographic Survey has determined the elevation of G.S.C. bench-mark 142 as 259.506, this value being obtained by water transfers from Tibbets Point, N.Y., during six years between the years 1909 and 1915. The elevation obtained by us by our line of precise levels from Rouse Point is 258.688—see page 321.

As in previous publications all elevations are instrumental and have had no adjustments applied to them, consequently changes may be made in the

future; it should be noted, however, that in almost all cases where circuits have been closed, the closing errors are quite small.

The standard bench-mark adopted consists of a copper bolt, three-quarters of an inch in diameter and four inches long, stamped on the end with the letters "G.S.C., B.M." (Geodetic Survey of Canada Bench-mark). The bolt is sunk horizontally in rock or masonry so that only the circular end is visible; the number of the bench-mark is stamped on this end as well as the letters mentioned above, and a horizontal chisel line is cut, upon which the elevation is taken. At certain points concrete bench-mark piers have been built; these project from six inches to one foot above the ground and extend below the frost line; the copper bolt upon which the elevation is taken is placed horizontally as in other cases, and is about nine inches below the top of the pier.

TABLE I.

## BENCH-MARKS BETWEEN ST. ANSELME, QUE., AND EDMUNDSTON, N.B., VIA NATIONAL TRANSCONTINENTAL RAILWAY

*Elevations on page 289*

- 223 B In east face of coping on south end of large concrete arch culvert under National Transcontinental railway, 3 miles east of St. Anselme and at mileage 76.3 from Monk
- 224 B In east face—6 inches below top—of coping on north end of concrete arch culvert under National Transcontinental railway,  $\frac{1}{2}$  mile west of Ste. Chene and at mileage 73.3 from Monk
- 225 B In east end of south face of concrete coping on south end of iron-pipe culvert under National Transcontinental railway, between first and second telegraph poles east of mile-post 71 from Monk
- 226 B Destroyed
- 227 B In west end of south face—15 inches below top—of southwest concrete retaining wall of National Transcontinental railway bridge over Etchemin river, immediately west of Ste. Malachie
- 228 B In centre of south face of small stone culvert under National Transcontinental railway, 50 feet west of a private crossing at mileage 63.2 from Monk
- 229 B In west face of northwest concrete retaining wall of National Transcontinental railway bridge over Abenakis river, 2 miles east of Abenakis
- 230 B In west face—44 inches below top—of south face wall of concrete culvert under National Transcontinental railway in a deep fill at sixth telegraph pole west of mile-post 57 from Monk
- 231 B In west face of north face wall of concrete arch culvert under National Transcontinental railway,  $1\frac{1}{2}$  miles east of St. Damien and at mileage 51.7 from Monk
- 232 B Destroyed
- 233 B In west end of south face of small concrete arch culvert under National Transcontinental railway at mileage 49.1 from Monk
- 234 B In east end of north face of small concrete arch culvert under National Transcontinental railway,  $\frac{1}{2}$  mile west of Armagh and at mile-post 46 from Monk
- 235 B In west face of north face wall of concrete arch culvert under National Transcontinental railway at first telegraph pole east of mile-post 43 from Monk
- 236 B In east end of south face of small concrete arch culvert under National Transcontinental railway at sixteenth telegraph pole east of mile-post 40 from Monk
- 237 B In east end of south face of small concrete arch culvert under National Transcontinental railway,  $\frac{1}{2}$  mile east of St. Eustache and at thirtieth telegraph pole east of mile-post 37 from Monk
- 238 B In west face of coping on north end of large concrete arch culvert under National Transcontinental railway, 2 miles east of Pasville and at mileage 34.6 from Monk
- 239 B In east face—5 inches below top—of coping on north end of large concrete arch culvert under National Transcontinental railway,  $1\frac{1}{2}$  miles east of Pasville and at mileage 30.4 from Monk
- 240 B In south face of coping on south end of large concrete arch culvert under National Transcontinental railway,  $1\frac{1}{2}$  miles east of Pasville and at mileage 27.2 from Monk

- 241-B In west face of southeast concrete retaining wall—6 inches below bridge-seat—of plate-girder bridge on National Transcontinental railway, at mile-post 25 from Monk
- 242-B Destroyed
- 243-B In north sloping face—5 inches below top—of concrete retaining wall behind east abutment of plate-girder bridge over Méchant-ponce river, 0.4 mile west of Ste. Appoline
- 244-B In north face of half buried boulder, in an earth cut, at south side of National Transcontinental railway track and at fourth telegraph pole west of mile-post 18 from Monk
- 245-B In west face of concrete retaining wall behind west abutment of plate-girder bridge over Bras d'Apic river (west),  $\frac{1}{2}$  mile west of Bras d'Apic. The bench-mark is 8 feet south of track and 6 inches below top of retaining wall
- 246-B In west end of south face—7 inches below top—of concrete arch culvert under National Transcontinental railway,  $2\frac{1}{2}$  miles east of Bras d'Apic and at mileage 12.3 from Monk
- 247-B In east face of large prominent boulder in ditch at south side of National Transcontinental railway track, between eleventh and twelfth telegraph poles east of mile-post 10 from Monk
- 248-B In south face of boulder—12 feet by 8 feet—6 feet north of north line of National Transcontinental railway right-of-way, 500 feet east of a wooden culvert and between twentieth and twenty-first telegraph poles east of mile-post 7 from Monk
- 249-B In south face of flat boulder—9 feet by 7 feet—35 feet north of National Transcontinental railway track and at eighth telegraph pole west of mile-post 3 from Monk
- 385-B In rear (or south) concrete foundation wall—9 inches below woodwork and 40 inches from southeast corner—of station-house at Monk
- 384-B In west face of north face-wall—9 inches below top—of very large concrete arch culvert through which rivière Ouelle flows under National Transcontinental railway,  $\frac{1}{2}$  mile west of Lafontaine
- 383-B In east face of south face-wall—15 inches below top—of concrete arch culvert under National Transcontinental railway, at sixth telegraph pole west of mile-post 116 from Edmundston
- 382-B In north side of rock cut on National Transcontinental railway—165 feet east of west end of cut and at rail level—1,023 feet east of mile-post 114 from Edmundston
- 381-B In north face of boulder, 10 feet south of National Transcontinental railway track—near centre of shallow earth cut—1 mile west of Lefebvre and between sixth and seventh telegraph poles west of mile-post 109 from Edmundston
- 380-B In east concrete foundation wall—20 inches below woodwork and 22 inches from southeast corner—of station-house at Lefebvre
- 379-B In east face of south face-wall—11 inches below top—of large concrete arch culvert under National Transcontinental railway,  $2\frac{1}{2}$  miles east of Lefebvre and at mileage 105.7 from Edmundston
- 378-B In south end of east face of concrete retaining wall behind west abutment of plate-girder bridge on National Transcontinental railway,  $1\frac{1}{2}$  miles west of Holiday and at mileage 101.3 from Edmundston
- 377-B In south face of boulder, 10 feet south of National Transcontinental railway track, 2 miles west of Bretagne and 110 feet west of mile-post 97 from Edmundston
- 376-B In north end of east face of concrete retaining wall behind west abutment—32 inches above bridge-seat—of three-span bridge over rivière du Loup, 3 miles east of Bretagne

- 375-B In south end of east face of concrete retaining wall behind west abutment of plate-girder bridge over river Manie,  $\frac{1}{2}$  mile east of River Manie station.
- 288-B In east face of boulder, 15 feet south of National Transcontinental railway track—in small cut—1 mile east of Lapointe and between fourth and fifth telegraph poles west of mile-post 81 from Edmundston.
- 287-B Destroyed.
- 286-B In south side of rock cut on National Transcontinental railway—at rail level and near first rock exposure from west end of cut— $1\frac{1}{4}$  miles west of Picard and between sixth and seventh telegraph poles west of mile-post 76 from Edmundston.
- 285-B In south end of west face of concrete retaining wall behind east abutment of plate-girder bridge over rivière Touchet,  $\frac{1}{2}$  mile east of Picard.
- 284-B In east face of north face-wall of very large concrete arch culvert under National Transcontinental railway, 600 feet west of a deep rock cut,  $1\frac{1}{4}$  miles east of Picard and at mileage 75.7 from Edmundston.
- 283-B In south end of west face of concrete retaining wall behind east abutment of plate-girder bridge over rivière Rochest,  $1\frac{1}{4}$  miles west of Pelletier.
- 282-B In west concrete foundation wall—4 inches below woodwork and 1 foot from northwest corner—of station-house at Pelletier.
- 281-B In west end of south face of small concrete arch culvert under National Transcontinental railway, 4 miles east of Pelletier.
- 280-B In north end of east face of concrete retaining wall behind west abutment of long steel trestle bridge on National Transcontinental railway, 24 miles west of St. Eleuthère.
- 279-B In east face of south face-wall—1 foot below top—of large concrete arch culvert under National Transcontinental railway,  $1\frac{1}{4}$  miles west of St. Eleuthère and at mileage 61.3 from Edmundston.
- 278-B In east end of north face of large concrete arch culvert under National Transcontinental railway,  $1\frac{1}{4}$  miles east of St. Eleuthère and at mileage 58.4 from Edmundston.
- 277-B In north face of concrete base of international boundary monument No. 178, 10 feet south of south line of National Transcontinental railway right-of-way and  $\frac{1}{2}$  mile west of Estcourt—on west bank of St. Francis river.
- 276-B In southern end of west face of concrete retaining wall behind east abutment—9 inches above bridge-seat—of National Transcontinental railway bridge over St. Francis river,  $\frac{1}{2}$  mile west of Estcourt.  
NOTE.—Check levelling of this monument shows that the abutment has shifted slightly since the original levelling was done; the elevation of this benchmark must therefore be considered unreliable.
- 275-B In south end of west face of concrete retaining wall behind east abutment—11 inches above bridge-seat—of plate-girder bridge on National Transcontinental railway, 24 miles east of Estcourt.
- 274-B In southern end of west face of concrete retaining wall behind east abutment—3 feet 6 inches above bridge-seat—of plate-girder bridge over Blue River, 1 mile west of Blue River station.
- 273-B In east end of south face of small concrete arch culvert under National Transcontinental railway, 3 miles east of Blue River station and at mileage 42.4 from Edmundston.
- 272-B In north face—directly above north face—of concrete arch culvert under National Transcontinental railway, 6 miles west of Estcourt and at mileage 38.8 from Edmundston.
- 271-B In south end of west face of concrete retaining wall behind west abutment—30 inches above bridge-seat—of plate-girder bridge over the narrowest Long lake,  $1\frac{1}{4}$  miles east of Grandville.

- 270 B In east face of north face-wall of large concrete arch culvert under National Transcontinental railway,  $\frac{1}{2}$  mile west of Courchesne.
- 269 B In south end of east face of concrete retaining wall behind west abutment—27 inches above bridge-seat—of plate-girder bridge on National Transcontinental railway,  $4\frac{1}{2}$  miles west of Lac Baker.
- 268 B In north face of small concrete arch culvert under National Transcontinental railway,  $2\frac{1}{2}$  miles west of Lac Baker.
- 267 B In east face—7 feet 6 inches below bridge-seat—of north concrete abutment of highway bridge over National Transcontinental railway, 0.6 mile east of Lac Baker.
- 266 B In east face of coping on south end of large concrete arch culvert under National Transcontinental railway,  $2\frac{1}{2}$  miles east of Lac Baker.
- 265 B In east face of coping on north end of concrete arch culvert under National Transcontinental railway, 3 miles west of Baker Brook.
- 264 B In east face—north side of track—of concrete retaining wall behind east abutment of plate-girder bridge on National Transcontinental railway,  $\frac{1}{2}$  mile west of Baker Brook.
- 263 B In east face of coping on south end of large concrete arch culvert under National Transcontinental railway,  $1\frac{1}{4}$  miles east of Baker Brook and  $\frac{1}{2}$  mile east of Temiscouata railway diamond crossing.
- 262 B In north face of small concrete arch culvert under National Transcontinental railway, 270 feet west of a highway crossing, 1 mile west of St. Hilaire and at mileage 8.5 from Edmundston.
- 261 B In east face of north face-wall of large concrete arch culvert under National Transcontinental railway,  $1\frac{1}{2}$  miles east of St. Hilaire and at fifth telegraph pole west of mile-post 6 from Edmundston.
- 260 B In west face of south face-wall of large concrete arch culvert under National Transcontinental railway, at first telegraph pole east of mile-post 3 from Edmundston.
- 58 B In Temiscouata railway bridge over Madawaska river at Edmundston—see line from St. Stephen to Rivière-du-Loup.

BENCH-MARKS BETWEEN HARLAKA JUNCTION AND RIVIERE-DU-LOUP, QUE.  
VIA INTERCOLONIAL RAILWAY, WITH CROSS-COUNTRY BRANCH  
LINE FROM ST. PHILIPPE-DE-NERI TO BRETAGNE.

*Elevations on page 291*

- 563 B In north face-wall of concrete tile culvert under Intercolonial railway, immediately west of La Durantaye station.
- 564 B In side of concrete bench-mark pier, 6 feet south of north line of Intercolonial railway right-of-way,  $1\frac{1}{2}$  miles west of St. Pierre and 1,050 feet west of mile-post 84 from Rivière-du-Loup—about midway between two farm crossings 600 feet apart.
- 565 B In second course below top, in north face of west abutment of small square stone culvert under Intercolonial railway,  $\frac{1}{4}$  mile east of St. Pierre and 870 feet west of mile-post 82 from Rivière-du-Loup.
- 566 B In south end of east face of concrete retaining wall behind west abutment—18 inches above bridge-seat—of plate-girder bridge over bras St. Nicholas, rivière-du-Sud,  $\frac{1}{2}$  mile east of Montmagny.
- 567 B In north face of very large flat boulder, immediately south of north line of Intercolonial railway right-of-way and 70 feet west of easterly switch of passing-track at Cap St. Ignace—0.6 mile east of the station.

- 568 B In stone water-table course, in west foundation wall of Intercolonial station-house at L'Islet—10 feet from southwest corner of building
- 569 B In south end of east face of concrete retaining wall behind west abutment—27 inches above bridge-seat—of plate-girder bridge on Intercolonial railway, 1 mile east of L'Islet and at mileage 63.6 from Rivière-du-Loup
- 570 B In north end of east face of concrete retaining wall behind west abutment—13 inches above bridge-seat—of plate-girder bridge on Intercolonial railway,  $1\frac{1}{2}$  miles west of St. Jean Port Joli and immediately east of a highway crossing
- 571 B In east end of south face-wall of concrete tile culvert under Intercolonial railway—at a farm crossing—1 mile west of Elgin Road flag-station and at mileage 53.3 from Rivière-du-Loup
- 572 B In south face of large irregular boulder, 10 feet north of south line of Intercolonial railway right-of-way, 120 feet east of a farm crossing and 2,000 feet east of mile-post 46 from Rivière-du-Loup
- 573 B In east end—20 inches below top—of south face-wall of (double) concrete tile culvert under Intercolonial railway, 170 feet east of railway section post between sections 8 and 9 and at mileage 43.7 from Rivière-du-Loup
- 574 B In side of concrete bench-mark pier, 4 feet south of north line of Intercolonial railway right-of-way, 130 feet east of one and 270 feet west of another farm crossing,  $1\frac{1}{2}$  miles west of St. Pacôme and between fifteenth and sixteenth telegraph poles east of mile-post 39 from Rivière-du-Loup

#### Cross-country branch line to Bretagne.

- 27 G In west end—1 foot below top—of south face-wall of concrete tile culvert under Intercolonial railway, 450 feet east of St. Philippe-de-Neri station
- 28-G In third course of stonework above ground, in south wall 3 feet from front (or west) wall—of Roman Catholic church at Mont Carmel
- 29-G In northeast face of large mass of rock, 20 feet from southeast corner of George Russell's house and 3 miles south of Mont Carmel Roman Catholic church
- 30-G In east face of large boulder in field belonging to Antoine St. Onge, 100 feet from northwest corner of his house and on opposite side of road. This is about  $3\frac{1}{4}$  miles north of Bretagne—on road to St. Philippe-de-Neri
- 577 B In boulder beside National Transcontinental railway, 2 miles west of Bretagne—see line from St. Anselme to Edmundston

#### Main line, continued.

- 575 B In east end—3 feet 8 inches below top—of north face-wall of (triple) concrete tile culvert under Intercolonial railway,  $1\frac{1}{2}$  miles east of St. Philippe-de-Neri and at mileage 29.7 from Rivière-du-Loup
- 576 B In south end of east face of concrete retaining wall behind west abutment—22 inches above bridge-seat—of plate-girder bridge on Intercolonial railway,  $1\frac{1}{2}$  miles west of St. Paschal and at mileage 26.6 from Rivière-du-Loup
- 577 B In north face, 5 feet 3 inches from east end—of concrete coping on northeast masonry retaining wall of plate-girder bridge on Intercolonial railway, 1 mile east of Dessaut and at mileage 21.7 from Rivière-du-Loup
- 578 B In east end—2 feet below top—of north face-wall of concrete tile culvert under Intercolonial railway, 80 feet east of station-house at St. Helene
- NOTE.—This benchmark has been rendered inaccessible by a timber extension constructed at north end of culvert.

- 579-B In second course of stonework below top, in south face of east abutment of old stone culvert under Intercolonial railway,  $1\frac{1}{2}$  miles east of St. André and at mileage 14.6 from Rivière-du-Loup.
- 579-B-2 In west end—19 inches below top—of south face-wall of concrete tile culvert under Intercolonial railway, 1 mile east of Old Lake Road station and 440 feet west of mile-post 5 from Rivière-du-Loup.
- 580-B In side of concrete bench-mark pier, 4 feet north of south line of Intercolonial railway right-of-way, 12 feet east of a farm crossing, 945 feet west of mile-post 2 from Rivière-du-Loup and 25 feet west of a small rocky knoll between track and south fence of right-of-way.
- 77 B In Intercolonial railway bridge immediately north of Rivière-du-Loup station—see line from St. Stephen to Rivière-du-Loup.

BENCH-MARKS BETWEEN OTTAWA AND RENFREW, ONT.  
VIA CANADIAN PACIFIC RAILWAY TO ARNPRIOR  
AND GRAND TRUNK RAILWAY TO RENFREW.

*Elevations on page 293.*

**Note.**—These descriptions are written with the assumption that the railway runs in a southwesterly direction from Ottawa to Carleton Place, thence northwesterly to Arnprior and thence westerly to Renfrew.

- 50 G In northeast end of northwest face of small square concrete culvert under Canadian Pacific railway, at mileage 1.7 west of Ottawa (Broad street station).
- 51 G In northeast end of northwest face of (double) square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile northeast of Britannia flag-station and at mileage 4.4 from Ottawa.
- 52 G In northwest face of masonry retaining wall beside Canadian Pacific railway track along the shore of lake Deschênes. The bench-mark is 14 inches below top of concrete coping of wall and immediately north-east of culvert at mileage 6.1 from Ottawa.
- 53 G In north end of east face of west concrete abutment—18 feet below bridge-seat—of bridge by which Canadian Northern railway passes over Canadian Pacific railway, at mileage 8.2 from Ottawa (Broad street station).
- 54 G In northeast end of northwest face of square concrete culvert under Canadian Pacific railway, 110 feet south-west of southwesterly switch of Nepean passing-track and at mileage 10.9 from Ottawa.
- 55 G In northeast end of northwest face of square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile north-east of Stittville and at mileage 14.1 from Ottawa.
- 56 G In northeast end of northwest face of square concrete culvert under Canadian Pacific railway, at mileage 17.5 from Ottawa.
- 57 G In northeast end of northwest face of square concrete culvert under Canadian Pacific railway, at mileage 20.5 from Ottawa.
- 58 G In southwest end of northwest face of square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile north-east of Ashton and at mileage 22.8 from Ottawa.
- 59 G In southwest face—10 inches below top—of northwest face-wall of square concrete culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles northeast of Carleton Place and at northeast line of a highway crossing at mile-post 26 from Ottawa.
- 60 G In east end of north wall—31 inches below water-table—of Canadian Pacific machine shop at Carleton Place—a large stone building immediately west of the station.



- 61 G In fourth course of stonework below water-table course, in north end of front (or west) wall of Carleton Place post-office.
- 62 G In fourth course of stonework below top, in west face of coping on east end of first pier from southerly abutment of Canadian Pacific railway bridge over Mississippi river,  $\frac{1}{2}$  mile northwest of station at Carleton Place.
- 63 G In southeast end of northeast face of large square concrete culvert under Canadian Pacific railway, 4 miles northwest of Carleton Place and at mileage 32.5 from Ottawa.
- 64 G In eighth course of stonework below water-table course, in south end of front (or east) wall of Almonte town-hall.
- 65 G In west foundation wall—2 feet 3 inches above concrete sidewalk and 3 feet from southwest corner—of Almonte post-office.
- 66 G In southwest end of northwest face of concrete retaining wall behind southeast abutment of Canadian Pacific railway bridge over Mississippi river,  $\frac{1}{2}$  mile northwest of station at Almonte.
- 67 G In side of concrete bench-mark pier, 8 feet northeast of southwest line of Canadian Pacific railway right-of-way, at fifth telegraph pole northwest of mile-post 40 from Ottawa, 1 mile northwest of Snodden flag-station and 30 feet southeast of a private crossing leading to James Temmen's (red brick) farm house which is situated about 100 yards northeast of the railway.
- 68 G In northwest face—22 inches above bridge-seat—of concrete retaining wall behind southeast abutment of subway under Canadian Pacific railway, 800 feet southeast of Pakenham station. The bench-mark is 5 feet northeast of northeasterly girder of bridge.
- 69 G In second course of stonework below iron sheeting, in east end of north foundation wall of Renfrew Flour Company's flour shed at Pakenham—a sheet-iron covered building immediately east of Canadian Pacific railway and  $\frac{1}{2}$  mile north of the station.
- 70 G In southeast end of northeast face of square concrete culvert under Canadian Pacific railway—at a diagonal highway crossing—between third and fourth telegraph poles northwest of mile-post 46 from Ottawa.
- 71 G In northwest end of northeast face of square concrete culvert under Canadian Pacific railway—at a highway crossing—100 feet southeast of southeasterly switch of Waba passing-track and between first and second telegraph poles northwest of mile-post 48 from Ottawa.
- 72 G In top course of stonework, in northeast face—near centre—of east retaining wall of plate-girder subway under Canadian Pacific railway,  $1\frac{1}{2}$  miles southeast of Arnprior and at mileage 50.4 from Ottawa.
- 73 G In front (or west) wall of Canadian Pacific station-house at Arnprior, 15 inches below plinth course and 4 feet from northwest corner of building.
- 74 G In ninth course of stonework below brickwork, in north wall of Arnprior town-hall—facing Madawaska street. The bench-mark is 38 feet from northwest corner of building and is in north face of corner stone at northwest corner of a projection from the north wall.
- 75 G In second course of stonework below water-table course, in west wall of Arnprior post-office, between the two basement windows which are between the letter-drop and the doorway of custom-office.
- 76 G In second course of stonework below top, in west end of south face of southwest retaining wall of plate-girder bridge on Grand Trunk railway, 24 miles east of Glasgow and at mileage 176.6 from Alburgh Junction.
- 77 G In second course of stonework below top, in west end of north face of northwest retaining wall of plate-girder bridge on Grand Trunk railway, 1 mile west of Glasgow.

- 78-G In north face of rock exposure at northerly side of a rocky hill skirted by Grand Trunk railway, 5½ miles east of Renfrew and at mileage 182.4 from Alburgh Jet. The bench-mark is 15 feet south of south line of right-of-way, 340 feet east of a small wooden culvert and 55 feet east of a whistle-post.
- 79-G In side of concrete bench-mark pier, 7 feet south of north line of Grand Trunk railway right-of-way, 490 feet east of a small culvert, 2 miles east of Renfrew and 350 feet west of mile-post 186 from Alburgh Junction.
- 505 In third course of stonework below water-table course, in front (or west) wall of Renfrew post-office, 8 feet to the south of the letter-drop.

BENCH-MARKS BETWEEN KEMPTON AND IVANHOE, ONT., VIA CANADIAN PACIFIC RAILWAY,  
WITH BRANCH LINES FROM SMITHS FALLS TO CARLETON PLACE AND  
BROCKVILLE, SHARBOT LAKE TO RENFREW AND KINGSTON AND  
(ALONG GRAND TRUNK RAILWAY) FROM  
IVANHOE TO BELLEVILLE.

*Elevations on pages 295 to 301.*

- 80-G In second course of stonework below top, in east end of north face of northeast retaining wall of Canadian Pacific railway bridge over Kemptonville creek, 2 miles west of Kempton.
- 81-G In west face of coping on north end of small concrete arch culvert under Canadian Pacific railway, at the east line of a highway crossing at mileage 108.4 from Montreal West.
- 82-G In east face of coping on south end of concrete arch culvert under Canadian Pacific railway, ¼ mile east of Burritt flag-station and at mileage 110.6 from Montreal West.
- 83-G In west end of north face of square concrete culvert under Canadian Pacific railway, at mile-post 113 from Montreal West.
- 84-G In north face—8 inches below top—of concrete retaining wall behind east abutment of subway under Canadian Pacific railway, 0.6 mile east of Merrickville and 400 feet east of east end of bridge over Rideau river.
- 85-G In west end of north face—1 foot below top—of square concrete culvert under Canadian Pacific railway, 50 feet east of a farm crossing at mileage 116.7 from Montreal West.
- 86-G In north end of west face—4 inches below top—of concrete retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway, 500 feet east of Rosedale flag-station and at mileage 119.8 from Montreal West.
- 87-G In east face of coping on south end of small concrete arch culvert under Canadian Pacific railway, 1¼ miles east of Smiths Falls station and at mileage 122.5 from Montreal West.
- 88-G In concrete foot-subway under Canadian Pacific railway at north end of station platform at Smiths Falls. The bench-mark is in east wall of Herbert street approach—from the direction of the station, 15 inches below top of wall and 36 feet south of south side of passageway under tracks. (The railway is assumed to run north and south at Smiths Falls).
- 89-G In southeast face of concrete retaining wall behind north abutment—3 feet above bridge-seat—of subway by which Canadian Northern railway passes under Canadian Pacific railway (main line and branch to Carleton Place), ¼ mile north of Smiths Falls station. The bench-mark is 2 feet east of easterly girder on Carleton Place line.

**Branch line to Carleton Place.**

- 90-G In west face—near centre—of square concrete culvert under Canadian Pacific railway, 1¼ miles north of Smiths Falls station and at mileage 15.2 from Carleton Place.

- 91-G In south end of east face of square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile north of Welsh flag station and between second and third telegraph poles north of mile-post 13 from Carleton Place.
- 92-G In north end of east face of square concrete culvert under Canadian Pacific railway,  $1\frac{1}{2}$  miles south of Franktown and at mileage 9.4 from Carleton Place.
- 93-G In north end of west face of square concrete culvert under Canadian Pacific railway, at ninth telegraph pole south of mile-post 5 from Carleton Place.
- 94-G In east face—near centre—of small square concrete culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles south of Carleton Place and at the south line of a highway crossing.
- 60-G In Canadian Pacific machine shop at Carleton Place—see line from Ottawa to Renfrew.

#### Branch line to Brockville.

- 95-G In second course of stonework below top, in south end of east face of southwest retaining wall of subway under Canadian Pacific railway, 200 feet south of bridge over Rideau river and  $1\frac{1}{2}$  miles south of Smiths Falls station.
- 96-G In south face of west face-wall of square concrete culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles north of Jasper and at mileage 21.7 from Carleton Place.
- 97-G In east end of south face of concrete retaining wall behind north abutment of Canadian Pacific railway bridge over Irish creek, immediately south of Jasper station.
- 98-G In north end of west face of coping on west end of small concrete arch culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles south of Jasper and at mileage 26.5 from Carleton Place.
- 99-G In second course of stonework below top, in south end of east face of small masonry culvert under Canadian Pacific railway, at second telegraph pole south of mile-post 30 from Carleton Place.
- 100-G In north end of west face of square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile north of Jelly flag station and at mileage 32.5 from Carleton Place.
- 101-G In south end of east face of large square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile north of Bellamy and at mileage 34.6 from Carleton Place.
- 102-G In south end of west face of square concrete culvert under Canadian Pacific railway at south line of highway crossing at Hawkens flag station.
- 103-G In south end of east face of square concrete culvert under Canadian Pacific railway,  $4\frac{1}{2}$  miles north of Brockville and at mileage 40.5 from Carleton Place.
- 104-G Inside of concrete bench-mark pier, 7 feet west of east line of Canadian Pacific railway right-of-way,  $2\frac{1}{2}$  miles north of Brockville and 33 feet south of sixth telegraph pole south of a highway crossing—the road allowance between concessions II and III.
- 123 In culvert under Grand Trunk railway in Brockville—see line from Rouse Point to Colborne.
- 105-G In south end of west wall of Brockville court-house, 1 foot below sills of basement windows facing on William street.
- 106-G In first course of stonework above concrete sidewalk, in north wall of Brockville post-office. The bench-mark is in north side of pillar between the two arches at northeast corner of building.

#### Main line, continued.

- 107-G In first course of stonework below water-table course in east (or Market street) wall of Smiths Falls post-office—28 feet from southeast corner of building.

- 108-G In first course of stonework above water-table, in south face of pilaster at southeast corner of Smiths Falls town-hall—at northeast corner of Church and Beckwith streets.
- 109-G In east end of south face-wall of concrete tile culvert under Canadian Pacific railway,  $3\frac{1}{2}$  miles west of Smiths Falls and 630 feet east of a farm crossing.
- 110-G In east end of south face of eight-foot concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile east of Elmsley and at mileage 5.2 from Smiths Falls.
- 111-G In west end of north face of square concrete culvert under Canadian Pacific railway, at third telegraph pole east of mile-post 8 from Smiths Falls.
- 112-G In east end of south face of square concrete culvert under Canadian Pacific railway, 1,200 feet east of Perth station.
- 113-G In masonry base of Canadian Pacific water-tank at Perth, 7 feet to the left of the doorway underneath tank and in third course of stonework above doorsill.
- 114-G In south stone foundation wall of Perth public library, 4 feet west of main entrance and 13 inches above concrete sidewalk on Gore street.
- 115-G In water-table course of stonework, in front (or north) wall of Perth town-hall, 10 feet 6 inches from north-east corner of building.
- 116-G In north face-wall of small triangular concrete culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles west of Perth and at fourth telegraph pole east of mile-post 14 from Smiths Falls.
- 117-G In west end of north face of square concrete culvert under Canadian Pacific railway, 150 feet west of Glentay station.
- 118-G In north face of concrete retaining wall behind west abutment of small plate-girder bridge on Canadian Pacific railway,  $\frac{1}{2}$  mile east of Bathurst.
- 119-G In centre of north face of small square concrete culvert under Canadian Pacific railway—at the east line of a highway crossing—at third telegraph pole west of mile-post 6 from Glentay.
- 120-G In north side of curved rock cut on Canadian Pacific railway, 430 feet east of east line of a highway crossing and 55 feet east of mile-post 9 from Glentay.
- 121-G In west end of north face of large square concrete culvert under Canadian Pacific railway, 140 feet west of westerly switch of Maherley passing-track and 65 feet east of a hand-car house.
- 122-G In south face—slightly below rail level—of large mass of rock on north side of Canadian Pacific railway track, immediately east of a small rock cut; also 390 feet west of mile-post 14 from Glentay and 40 feet west of a wooden culvert.
- 123-G In east end of north face of small concrete arch culvert under Canadian Pacific railway, at mileage 17.4 from Glentay—within the limits of Ungava passing-track.
- 124-G In south side of rock cut on Canadian Pacific railway at Sharbot Lake station—48 feet east of westerly switch leading from main line to passing-track and 370 feet west of water column on main line opposite Union hotel.

**Branch line to Renfrew.**

- 125-G In west side of rock cut on Canadian Pacific railway—100 feet from south end of cut— $2\frac{1}{2}$  miles north of Sharbot Lake station and 160 feet south of mile-post 54 from Renfrew.
- 126-G In east face—near centre—of exposed rock surface immediately west of Canadian Pacific railway track, 1,080 feet south of a wooden culvert at mileage 51.2 from Renfrew; this exposure is on the side of a hill of rock which has been partly cut away to allow the track to pass.

- 127-G In east side of rock cut on Canadian Pacific railway—near centre of cut— $\frac{1}{2}$  mile north of Clarendon, 200 feet north of a wooden culvert and 570 feet north of a whistle-post for southbound trains.
- 128-G In north end of east face of coping on east end of large square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile south of Mississippi and at mileage 45.7 from Renfrew.
- 129-G In east face of concrete retaining wall behind south abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{2}$  mile north of Snow Road and at mileage 41.8 from Renfrew.
- 130-G In north end of east face of square concrete culvert under Canadian Pacific railway, at mileage 39.2 from Renfrew.
- 131-G In west side of small rock cut on Canadian Pacific railway, 520 feet south of mile-post 36 from Renfrew and 420 feet north of a white frame house on east side of tracks—immediately north of Wilbur station.
- 132-G In east side of rock cut on Canadian Pacific railway, 700 feet south of mile-post 33 from Renfrew and 350 feet north of sign "Lavant 1 mile"—north of station.
- 133-G In west face of concrete retaining wall behind south abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{2}$  mile north of Lavant and at mileage 39.2 from Renfrew.
- 134-G In east side of rock cut on Canadian Pacific railway—near south end of cut—1,110 feet north of mile-post 27 from Renfrew; this cut is on the first curve (about  $\frac{1}{2}$  mile) north of Clyde Forks.
- 135-G In north end of west face of large square concrete culvert under Canadian Pacific railway, 1 mile north of Flower and at mileage 24.5 from Renfrew; this structure is the farther north of two culverts about 25 feet apart.
- 136-G In north end of west face of square concrete culvert under Canadian Pacific railway, at mileage 22.4 from Renfrew.
- 137-G In east face of half-buried boulder, immediately west of Canadian Pacific Railway track and at south end of a small earth cut at mileage 49.7 from Renfrew. The bench-mark is 90 feet north of a small wooden culvert and 170 feet south of a whistle-post for northbound trains.
- 138-G In east side of rock cut on Canadian Pacific railway—near centre of cut— $\frac{1}{2}$  mile south of Barryvale and 215 feet south of mile-post 17 from Renfrew.
- 139-G In west end of south face of concrete retaining wall behind north abutment of highway bridge over Madawaska river, 100 yards south of Calabogie station and immediately east of Canadian Pacific railway bridge.
- 140-G In west side of rock cut on Canadian Pacific railway—80 feet from north end of cut—240 feet south of a small stone culvert at mileage 11.6 from Renfrew and 460 feet south of sign "Ashdod 1 mile"—south of station.
- 141-G In east face of large boulder, immediately west of Canadian Pacific railway track at mileage 7.6 from Renfrew—570 feet south of a whistle-post for southbound trains and 870 feet south of a small waterfall on opposite side of track.
- 142-G In east side of rock cut on Canadian Pacific railway—100 feet from north end of cut—580 feet south of mile-post 5 from Renfrew and just at the head of a grade.
- 143-G In south end of west face of coping on west end of concrete arch culvert under Canadian Pacific railway, at mileage 2.3 from Renfrew.
- 505 In third course of stonework below water-table course, in front (or west) wall of Renfrew post-office, 8 feet to the south of the letter-drop.

**Branch line to Kingston.**

- 144-G In west side of small rock cut on Canadian Pacific railway,  $2\frac{1}{2}$  miles south of Sharbot Lake station and at mileage 59.6 from Renfrew. The bench-mark is 9 feet south of a whistle-post for southbound trains and 940 feet south of south line of a highway crossing.
- 145-G In east face—near north end—of large sloping mass of rock immediately west of Canadian Pacific railway track and at mileage 62.4 from Renfrew; this is 200 feet south of a rock cut which is at the south end of a rather deep fill.
- 146-G In south face, 7 inches below top, of disused block of concrete—2 feet by 3 feet—originally used in connection with interlocking plant at Tichborne; this is immediately east of Canadian Pacific railway track (Kingston subdivision) and 300 feet north of diamond crossing of main line.
- 147-G In first course of stonework above bridge-seat, in west face of south abutment of small plate-girder bridge on Canadian Pacific railway,  $1\frac{1}{2}$  miles south of Tichborne and at mileage 66.7 from Renfrew.
- 148-G In west side of small shallow rock cut on Canadian Pacific railway, 40 feet south of a farm crossing, 60 feet north of mile-post 69 from Renfrew and  $2\frac{1}{2}$  miles north of Hinchinbrooke flag-station.
- 149-G In south face of west face-wall of large square concrete culvert under Canadian Pacific railway, 145 feet north of mile-post 71 from Renfrew and 0.4 mile north of Hinchinbrooke.
- 150-G In third course of stonework below bridge-seat, in west face of north abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{2}$  mile north of Godfrey.
- 151-G In west side of shallow rock cut on Canadian Pacific railway—near north end of cut—30 feet south of a whistle-post for northbound trains and between eighth and ninth telegraph poles north of mile-post 77 from Renfrew.
- 152-G In east face—8 inches below top—of north concrete abutment of plate-girder bridge on Canadian Pacific railway, at a water-tank,  $\frac{1}{2}$  mile south of Verona.
- 153-G In east face—near centre—of square concrete culvert under Canadian Pacific railway, 1,850 feet south of Hartington station.
- 154-G In south end of east face of coping on east end of concrete arch culvert under Canadian Pacific and Canadian Northern railways, 220 feet north of Harrowsmith station.
- 155-G In east face of south concrete abutment—6 inches below bridge-seat—of plate-girder bridge on Canadian Pacific railway,  $2\frac{1}{2}$  miles south of Harrowsmith and at mileage 87.3 from Renfrew.
- 156-G In south end of east face of square concrete cattle-pass under Canadian Pacific railway,  $\frac{1}{2}$  mile south of Murvale.
- 157-G In west side of shallow limestone cut on Canadian Pacific railway,  $\frac{1}{2}$  mile north of Glenvale and 330 feet north of an old stone culvert at mileage 92.7 from Renfrew.
- 158-G In west side—near centre—of long curved limestone cut on Canadian Pacific railway,  $1\frac{1}{2}$  miles south of Glenvale and at mileage 94.7 from Renfrew. The bench-mark is at the centre of a smooth clean-cut exposure about 30 feet in length, and is 885 feet north of north line of a highway crossing.
- 159-G In west face of square concrete culvert running diagonally under Canadian Pacific railway—in a rock cut—360 feet south of highway crossing at "Jackson's mill" and at mileage 96.3 from Renfrew. The bench-mark is 15 inches south of northwesterly outlet of culvert and 7 feet east of west side of rock cut.
- 160-G In side of concrete bench-mark pier, 7 feet east of west line of Canadian Pacific railway right-of-way and 235 feet south of a small open culvert with stone abutments; this is at mileage 99.2 from Renfrew and  $2\frac{1}{2}$  miles northwest of Grand Trunk station at Kingston Junction.
- 139 In Grand Trunk station-house at Kingston Junction—see line from Rouse Point to Colborne.

## Main line, continued.

- 161-G In south end of east face of concrete retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile west of Sharbot Lake station and at mileage 23.9 from Glentay.
- 162-G In north face of wall of small trough-like concrete culvert under Canadian Pacific railway, at mileage 27.3 from Glentay, within the limits of Olden, passing track.
- 163-G In east end of north face of square concrete culvert under Canadian Pacific railway, at the east line of a telephone crossing near track east of Mountain Grove station.
- 164-G In north side of rock cut on Canadian Pacific railway, 545 feet west of milepost 33 from Glentay and 450 feet west of a private crossing beside which is situated a square frame house about 200 feet south of the railway.
- 165-G In south face of concrete retaining wall on east end of north face of northeast retaining wall of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Ardendale.
- 166-G In south face of concrete retaining wall on north side of Canadian Pacific railway track, 140 feet east of claim pole, and 2,000 feet east of a concrete culvert, at mileage 38.2 from Glentay.
- 167-G In south face of exposed rock surface, 25 feet north of south line of Canadian Pacific railway right-of-way, 500 feet east of a concrete retaining wall on the passing track, and at approximate mileage 41.3 from Glentay.
- 168-G In south face of concrete retaining wall on Canadian Pacific railway, near centre of cut, 570 feet east of a concrete culvert, and 2.5 miles west of milepost 44 from Glentay.
- 169-G In south face of concrete retaining wall on north side of concrete culvert under Canadian Pacific railway,  $\frac{1}{4}$  mile west of Glentay, at mileage 41.3 from Glentay.
- 170-G In south face of concrete retaining wall on north side of concrete culvert under Canadian Pacific railway, at mileage 40.0 from Glentay.
- 171-G In south face of concrete retaining wall on north side of Canadian Pacific railway track, near rail level, 740 feet east of a concrete retaining wall on the passing track, and of twenty-second telegraph pole west of milepost 44 from Glentay.
- 172-G In south face of concrete retaining wall on north side of concrete culvert under Canadian Pacific railway,  $\frac{1}{4}$  mile west of Saldale, and 4 miles west of Glentay.
- 173-G In north face of concrete retaining wall on north side of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Glentay and at mileage 60.4 from Glentay.
- 174-G In south face of concrete retaining wall on north side of concrete retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile west of Glentay.
- 175-G In south face of concrete retaining wall on north side of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Glentay.
- 176-G In south face of concrete retaining wall on north side of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Glentay.
- 177-G In south face of concrete retaining wall on north side of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Glentay.
- 178-G In south face of concrete retaining wall on north side of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Glentay.
- 179-G In south face of concrete retaining wall on north side of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Glentay.
- 180-G In south face of concrete retaining wall on north side of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Glentay.

- 179-G In south face of concrete coping on stone retaining wall behind east abutment of bridge by which Canadian Pacific railway passes over Grand Trunk railway, 1 mile east of Ivandine C.P.R. station and  $\frac{1}{4}$  mile south of Crookston G.T.R. station.

**Branch line to Belleville.**

- 180-G In boulder 13 feet east of Grand Trunk railway track, 520 feet north of a highway crossing, 100 feet north of a red brick farm house and at mileage 18.3 from Belleville harbour.
- 181-G In boulder 17 feet east of Grand Trunk railway track, on north side of public highway immediately north of West Huntingdon station.
- 182-G In north face of large boulder, 93 feet east of Grand Trunk railway track, on south line of public highway immediately north of Madoc Junction station—at the foot of a large fir tree.
- 183-G In side of concrete bench mark pier on Grand Trunk railway right-of-way between track and line of telegraph poles at seventh pole north of a highway crossing or fifteenth pole north of mile-post 10 from Belleville harbour—at the southeast end of an old gravel pit.
- 184-G In first altar step below top—on east face of southeast concrete retaining wall of Grand Trunk railway bridge over Monie river immediately south of Foxboro.
- 185-G In first course of stonework below bridge seat, on east face of south abutment of small plate-girder bridge on Grand Trunk railway, 400 feet south of the iron road crossing at Carletonville.
- 186-G In south face of very large boulder lying on east line of Grand Trunk railway right-of-way, 1.6 miles north of Belleville station and between seventh and eighth telegraph poles south of mile-post 1 from Belleville harbour.
- 186 In Grand Trunk station-house at Belleville—see line from Rouse Point to Colborne.

**BENCH-MARKS BETWEEN STEELTON AND FRANZ, ONT., VIA ALGOMA  
CENTRAL AND HUDSON BAY RAILWAY, WITH BRANCH LINE TO  
MICHIPICOTEN.**

*Elevation on page 302.*

- 637 In south face—46 inches below top—of west face wall of concrete arch culvert under Algoma Central railway, at mileage 3.2 from Sault Ste. Marie.
- 638 In north face—8 inches below top—of coping on west end of large concrete arch culvert through which Root River flows under Algoma Central railway, at mileage 6.8 from Sault Ste. Marie.
- 639 In east side of small rock cut on Algoma Central railway—near north end of cut—37 feet south of first telegraph pole south of mile-post 10 from Sault Ste. Marie.
- 640 In west side of small rock cut on Algoma Central railway—2 feet above rail level—480 feet north of Hoxton station-house and 15 feet south of mile-post 14 from Sault Ste. Marie.
- 641 In east side of rock cut on Algoma Central railway—near centre of cut—780 feet north of Island Lake station and 15 feet south of mile-post 16 from Sault Ste. Marie.
- 642 In east face of exposed rock surface—45 feet west of Algoma Central railway track, 180 feet north of north end of a long steel-truss bridge at  $\frac{1}{4}$  mile north of Belleville.
- 643 In west face of small boulder—50 feet west of Algoma Central railway track and 21 feet south of second telegraph pole north of mile-post 22 from Sault Ste. Marie.
- 644 In north face—9 inches below top—of east face wall of concrete arch culvert under Algoma Central railway, at mile-post 25 from Sault Ste. Marie.



645. In east side of rock cut on Algoma Central railway—14 feet from north end of cut—720 feet south of rapid crossing at Glendale, between second and third telegraph poles south of mile-post 28 from Sault Ste. Marie.
646. In south face—18 inches below top of southeastern retaining wall of steel truss bridge over Goulais River—1 mile south of Sault Ste. Marie.
647. In west face of rock cut—12 feet east of Algoma Central railway track and at south end of a clay cut—between third and fourth telegraph poles south of mile-post 30 from Sault Ste. Marie.
648. In west face of small boulder—15 feet west of Algoma Central railway track and at north telegraph pole north of mile-post 30 from Sault Ste. Marie.
649. In west face of concrete retaining wall below north abutment of plate girder bridge over Ashigan river—2½ miles south of Ashigan Falls—18 miles S. of Sault Ste. Marie.
650. In east side of rock cut on Algoma Central railway—12 feet from south end of cut and near rail level—1 mile south of Ashigan—220 feet east of first telegraph pole north of mile-post 30 from Sault Ste. Marie.
651. In east face of boulder half buried in gravel—17 feet west of Algoma Central railway track and 3 feet above rail level—between first and second telegraph poles north of mile-post 30 from Sault Ste. Marie.
652. In west face of large rock cut on Algoma Central railway—100 feet from south end of cut and near rail level—mile north of Ogish—160 feet east of third telegraph pole south of mile-post 48 from Sault Ste. Marie.
653. In east face of concrete retaining wall below the abutment of plate girder bridge over south branch of Goulais River—1 mile south of Sault Ste. Marie.
654. In east side of rock cut on Algoma Central railway—50 feet from north end of cut and near rail level—480 feet south of Mile-Avenue—1 mile from north of mile-post 50 from Sault Ste. Marie.
655. In east side of rock cut on Algoma Central railway—Between first and second telegraph poles north of mile-post 57 from Sault Ste. Marie—60 feet south of end of trench over a small box of drainage.
656. In east side of rock cut on Algoma Central railway—100 feet from north end of cut—1 foot above rail level—between third and fourth telegraph poles north of mile-post 60 from Sault Ste. Marie and 600 feet north of north end of Ashigan River.
657. In west face of rock cut on Algoma Central railway—30 feet from south end of cut and 1 foot above rail level—4 miles south of Sault Ste. Marie—1 mile from mile-post 60 from Sault Ste. Marie.
658. In east side of rock cut on Algoma Central railway—100 feet from south end of cut—1 foot above rail level—1 mile south of Sault Ste. Marie—1 mile from mile-post 60 from Sault Ste. Marie.
659. In east face of concrete retaining wall below north abutment of plate girder bridge over north branch of Goulais River—1 mile south of Sault Ste. Marie.
660. In east side of rock cut on Algoma Central railway—200 feet north of south end of cut—1 mile from south of mile-post 60 from Sault Ste. Marie.
661. In east side of rock cut on Algoma Central railway—100 feet from south end of cut—1 foot above rail level—1 mile south of Sault Ste. Marie—1 mile from mile-post 60 from Sault Ste. Marie.
662. In east side of rock cut on Algoma Central railway—100 feet from south end of cut—1 foot above rail level—1 mile south of Sault Ste. Marie—1 mile from mile-post 60 from Sault Ste. Marie.

- 663 In east face of concrete retaining wall behind south abutment of plate-girder bridge over Batchawana river,  $\frac{1}{2}$  mile north of Batchawana.
- 664 In west side of large rock cut on Algoma Central railway—80 feet from south end of cut and 1 foot above rail level—2 miles north of Batchawana and 15 feet south of third telegraph pole north of mile-post 81 from Sault Ste. Marie.
- 665 In east side of rock cut on Algoma Central railway—200 feet from north end of cut—20 feet south of seventh telegraph pole north of mile-post 84 from Sault Ste. Marie.
- 666 In east side of rock cut on Algoma Central railway—near rail level—220 feet south of Regent south mile-board and between first and second telegraph poles south of mile-post 87 from Sault Ste. Marie.
- 667 In south end of east face—6 inches below top—of southeast concrete retaining wall of long steel trestle bridge over Montreal river,  $3\frac{1}{4}$  miles south of Montreal section-house.
- 668 In east face of small boulder, 20 feet west of Algoma Central railway track, 460 feet north of Montreal section-house and at third telegraph pole south of mile-post 95 from Sault Ste. Marie.  
NOTE.—Owing to the danger of this boulder being affected by frost, the elevation of this benchmark must be considered unreliable.
- 669 In west side of rock cut on Algoma Central railway—near rail level—25 feet south of second telegraph pole south of mile-post 98 from Sault Ste. Marie.
- 670 In west face of coffin-shaped mass of rock, about 12 feet in length, 20 feet east of Algoma Central railway track, 1 mile south of Frater and 25 feet south of mile-post 101 from Sault Ste. Marie.  
NOTE.—Owing to the danger of this boulder being affected by frost, the elevation of this benchmark must be considered unreliable.
- 671 In west side of rock cut on Algoma Central railway—75 feet from north end of cut—40 feet south of mile-post 101 from Sault Ste. Marie and 150 feet south of south end of long curved trestle bridge 2 miles north of Frater.
- 672 In east side of rock cut on Algoma Central railway—near north end of cut and at rail level—320 feet south of south end of a trestle bridge and 65 feet north of mile-post 107 from Sault Ste. Marie.
- 673 In east side of rock cut on Algoma Central railway—near rail level—240 feet south of south end of a small trestle and 50 feet south of mile-post 110 from Sault Ste. Marie.
- 674 In vertical rock surface—20 feet west of Algoma Central railway track and 75 feet south of eighth telegraph pole south of mile-post 113 from Sault Ste. Marie.
- 675 In west side of large rock cut on Algoma Central railway—at extreme north end of cut—30 feet south of first telegraph pole north of mile-post 116 from Sault Ste. Marie and at northerly entrance of Agawa river canyon.
- 676 In north face of exposed rock surface—25 feet west of Algoma Central railway track and 30 feet south of second telegraph pole north of mile-post 119 from Sault Ste. Marie.
- 677 In west face of exposed rock surface—20 feet east of Algoma Central railway track, 50 feet north of a small rock cut, and at second telegraph pole south of mile-post 124 from Sault Ste. Marie.
- 678 In east face of boulder, half buried in alluvium—30 feet west of Algoma Central railway track and 100 feet south of mile-post 124 from Sault Ste. Marie.
- 679 In west face of exposed rock surface—40 feet east of Algoma Central railway track, 60 feet north of north end of a trestle bridge, and 20 feet north of fourth telegraph pole south of mile-post 128 from Sault Ste. Marie.

- 680 In west face of exposed rock surface, 30 feet east of Algoma Central railway track,  $\frac{1}{2}$  mile north of Agawa section-house and 25 feet north of twelfth telegraph pole north of mile-post 131 from Sault Ste. Marie.
- 681 In west face of boulder, 30 feet east of Algoma Central railway track and 95 feet south of mile-post 134 from Sault Ste. Marie.
- 682 In west face of large white boulder, half buried in hill-side, 12 feet east of Algoma Central railway track and at fifth telegraph pole north of mile-post 137 from Sault Ste. Marie.
- 683 In east face of small boulder, 65 feet west of Algoma Central railway track, 460 feet north of southerly switch of Tabor passing-track and at third telegraph pole north of mile-post 140 from Sault Ste. Marie.
- 684 In west face of large white boulder, partly buried in hillside, 15 feet east of Algoma Central railway track and between first and second telegraph poles south of mile-post 143 from Sault Ste. Marie.
- 685 In east side of rock cut on Algoma Central railway—near centre of cut—450 feet north of north end of a trestle bridge and between fifth and sixth telegraph poles south of mile-post 146 from Sault Ste. Marie.
- 686 In east face of concrete retaining wall behind south abutment of plate-girder bridge over Michipicoten river, at mileage 151.6 from Sault Ste. Marie.
- 687 In east face of large black boulder, 30 feet west of Algoma Central railway track and between fourteenth and fifteenth telegraph poles south of mile-post 155 from Sault Ste. Marie.
- 688 In east face of exposed rock surface—40 feet west of Algoma Central railway track and about 4 feet below rail level—at first telegraph pole south of mile-post 158 from Sault Ste. Marie.
- 689 In west face of exposed rock surface—27 feet east of Algoma Central railway track and near rail level— $1\frac{1}{2}$  miles south of station at Hawk Junction and at fourth telegraph pole north of mile-post 162 from Sault Ste. Marie.

#### Michipicoten branch line.

- 690 In south face of vertical rock surface of steep rocky hill immediately west of Algoma Central railway track (Michipicoten branch),  $\frac{1}{2}$  mile north of station at Hawk Junction, at eleventh telegraph pole north of mile-post 20 from Michipicoten and opposite a point on main line at mileage 164.8 from Sault Ste. Marie. The bench-mark is 90 feet west of track, 3 feet above ground and about at rail level.
- 691 In south side of rock cut on Algoma Central railway—15 feet south of track and near centre of cut—at mile-post 23 from Michipicoten.
- 692 In north side of wide rock cut on Algoma Central railway—15 feet north of track, 100 feet west of sixth telegraph pole west of mile-post 20 from Michipicoten and 600 feet east of concrete culvert—the first one west of spur line to Josephine mine.
- 693 In north face of exposed rock surface—15 feet south of Algoma Central railway track and 100 feet west of mile-post 17 from Michipicoten.
- 694 In north face of exposed rock surface at the base of a rocky hill immediately south of Algoma Central railway track and 70 feet east of mile-post 14 from Michipicoten—bearing a large mark.
- 695 In north side of rock cut on Algoma Central railway—2 feet above rail level and 60 feet east of mile-post 11 from Michipicoten.
- 696 In west face of bluff on track—100 feet south of Algoma Central railway track and 70 feet west of first telegraph pole west of mile-post 18 from Michipicoten.
- 697 In south side of rock cut on Algoma Central railway at eleventh telegraph pole east of mile-post 3 from Michipicoten.

- 698 In square-cut mass of rock, 230 feet south of Algoma Central railway track and 275 feet east of hotel at Michipicoten.

**Main line, continued.**

- 699 In east side of small rock cut on Algoma Central railway—30 feet from south end of cut—4 miles north of station at Hawk Junction and at fifth telegraph pole south of mile-post 168 from Sault Ste. Marie. This cut is at the south end of a long muskeg.
- 700 In south face of vertical rock surface, 20 feet west of Algoma Central railway track and at the south end of a rock cut. The bench-mark is 300 feet south of a trestle bridge and at eighth telegraph pole north of mile-post 171 from Sault Ste. Marie.
- 701 In west face of vertical rock exposure—2 feet above ground—200 feet east of Algoma Central railway track and at third telegraph pole south of mile-post 174 from Sault Ste. Marie.
- 702 In west face of large rough mass of rock—at north end of long deep rock cut—50 feet east of Algoma Central railway track and between eighth and ninth telegraph poles south of Goudreau section-house, or south of mile-post 177 from Sault Ste. Marie.
- 703 In east face of boulder, half buried in hillside, 40 feet west of Algoma Central railway track, 50 feet south of a deep rock cut and at first telegraph pole north of mile-post 180 from Sault Ste. Marie—3 miles north of Goudreau section-house.
- 704 In west face of vertical rock surface, 70 feet east of Algoma Central railway track and between first and second telegraph poles south of mile-post 183 from Sault Ste. Marie. This rock surface forms the northwest corner of a rocky hill; a muskeg lies immediately to the north.
- 705 In south face of large pyramid shaped boulder, 90 feet east of Algoma Central railway track,  $1\frac{1}{2}$  miles south of Wanda section-house and tank, and between second and third telegraph poles south of mile-post 186 from Sault Ste. Marie. This boulder is also opposite a borrow pit at north end of a long deep fill.
- 706 In east face of exposed rock surface, 37 feet west of Algoma Central railway track, 2 miles north of Wanda section-house and tank, and between thirteenth and fourteenth telegraph poles north of mile-post 189 from Sault Ste. Marie. This exposure forms a small vertical surface in a sloping hill of rock at north end of a large ballast pit.
- 707 In south face of large triangular boulder, 30 feet west of Algoma Central railway track,  $2\frac{1}{2}$  miles south of Frans and 100 feet north of mile-post 192 from Sault Ste. Marie.
- 708 In west face of exposed rock surface, 65 feet east of Algoma Central railway track at Frans, 650 feet south of diamond crossing of Canadian Pacific railway and 120 feet south of home semaphore of interlocking plant.

**BENCH-MARKS BETWEEN KIPP, ALTA., AND GOLDEN, B.C., VIA CANADIAN  
PACIFIC RAILWAY THROUGH CROWSNEST AND COLVALLI**

*Elevations on page 262.*

**Note.**—These descriptions are written with the assumption that the railway runs in a westerly direction from Kipp to Colvalli and thence northerly to Golden.

- 81-D In west concrete foundation wall—16 inches below woodwork and 4 feet from southwest corner—of Canadian Bank of Commerce at Monarch.
- 85-D In west face of southeast concrete retaining wall of steel trestle,  $\frac{1}{2}$  mile west of Monarch.

- 86-D In side of concrete bench-mark pier, 8 feet south of north line of Canadian Pacific railway right-of-way, 350 feet east of a highway crossing,  $5\frac{1}{2}$  miles east of Macleod and 268 feet west of mile-post 26 from Lethbridge.
- 87-D In second course of stonework below water-table course, in east end of north wall of Macleod court-house.
- 88-D In second course of stonework below water-table course, in east end of north wall of westerly wing of Macleod public school—9 feet west of main entrance.
- 89-D In north concrete foundation wall—6 inches below woodwork and 10 feet 6 inches from northwest corner of Canadian Pacific section-house, at east end of Stowe passing-track.
- 90-D In south end of east face of west abutment of large square concrete culvert under Canadian Pacific railway, at mileage 40.4 from Lethbridge.
- 91-D In west face of north face-wall of (double) square concrete culvert under Canadian Pacific railway, 100 feet west of westerly switch of Piegan passing-track and at mileage 41.7 from Lethbridge.
- 92-D In side of concrete bench-mark pier, 8 feet south of north line of Canadian Pacific railway right-of-way, 1,000 feet east of Chokio west mile-board and 23 feet west of mile-post 48 from Lethbridge.
- 93-D In north end of east face of concrete retaining wall behind west abutment—3 feet above bridge-seat—of steel trestle bridge over Pincher creek,  $1\frac{1}{4}$  miles west of Brocket.
- 94-D In east stone foundation wall—11 inches below woodwork and 20 inches from northeast corner—of Canadian Pacific section-house at Pincher, 270 feet east of the station.
- 95-D In west face of south face-wall of square concrete culvert under Canadian Pacific railway, 2, miles east of Cowley and at mileage 55.3 from Lethbridge.
- 96-D In east face of northwest concrete retaining wall—2 feet 8 inches above bridge-seat—of steel trestle bridge over south fork of Oldman river, 2, miles east of Cowley.
- 97-D In north concrete foundation wall—1 foot below top of foundation and 4 feet from northeast corner—of public school at Cowley,  $\frac{1}{4}$  mile southwest of the station.
- 98-D In east end of north face—3 feet below top—of concrete arch culvert under Canadian Pacific railway,  $1\frac{1}{2}$  miles east of Lethbridge and at second telegraph pole west of mile-post 71 from Lethbridge.
- 99-D In west face of concrete retaining wall behind east abutment—2 feet above bridge-seat and direct in line with northerly track—of Canadian Pacific railway bridge over Oldman river, 2, miles west of Lethbridge.
- 100-D In west face of south face-wall of concrete arch culvert under Canadian Pacific railway,  $1\frac{1}{2}$  miles west of Borman and at mileage 80.9 from Lethbridge.
- 101-D In south face of wall of rock culvert, north of Canadian Pacific railway track 100 feet west of Peabody west mile-board and 120 feet west of mile-post 84 from Lethbridge. The bench-mark is 1 foot above rail level.
- 102-D In south face of triple concrete culvert under Canadian Pacific railway—100 feet east of Frank station. The bench-mark is in wall between centre and western arches, 1 foot below top of concrete.
- 103-D In north face of east concrete abutment—22 inches below bridge-seat—of plate-girder bridge on Canadian Pacific railway, 10.4 miles east of Lethbridge and at mileage 57.8 from Lethbridge.
- 104-D In west end of south face of square concrete culvert under Canadian Pacific railway,  $1\frac{1}{4}$  miles east of Coleman and at mileage 90.1 from Lethbridge.
- 105-D In east end of north face of square concrete culvert under Canadian Pacific railway,  $1\frac{1}{4}$  mile west of Coleman and at mileage 92.1 from Lethbridge.

- 106-D In north face of small square concrete culvert under Canadian Pacific railway, 60 feet east of a highway crossing and at first telegraph pole east of mile-post 94 from Lethbridge.
- 107-D In north face of east concrete abutment—18 inches below bridge-seat—of plate-girder bridge on Canadian Pacific railway, at mileage 95.6 from Lethbridge and at east end of Sentry passing-track.
- 108-D In east face of south face-wall—16 inches below top—of large concrete arch culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles east of Crowsnest and at mileage 98.3 from Lethbridge; at "The cave, main source of Oldman river."
- 109-D In south face of concrete base of interprovincial boundary monument between Alberta and British Columbia, 50 feet north of Canadian Pacific railway main track at "The Great Divide"—530 feet east of Crowsnest station.
- 110-D In west end of south face of small square concrete culvert under Canadian Pacific railway, at mileage 1.9 from Crowsnest.
- 111-D In west face—10 inches below top—of concrete coping on top of a stone retaining wall lying along north side of Canadian Pacific railway track, at mileage 3.9 from Crowsnest.
- 112-D In south face—20 inches below top—of concrete retaining wall behind west abutment of plate-girder bridge over Michel creek, immediately west of McGillivray station.
- 113-D In north face of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $2\frac{1}{2}$  miles west of McGillivray and at mileage 9.2 from Crowsnest.
- 114-D In front (or east) face of concrete platform extending along front of Trites-Wood company's general store at Michel—a large concrete building immediately northwest of the station. The bench-mark is 2 feet 9 inches below top of platform and 6 feet from southeast corner.
- 115-D In north face of west concrete abutment—1 foot below bridge-seat—of plate-girder bridge over Michel creek,  $1\frac{1}{2}$  miles west of Natal and at mileage 15.8 from Crowsnest.
- 116-D In north face of west abutment of square concrete culvert under Canadian Pacific railway, 150 feet east of Wardrop west mile-board and at mileage 21.5 from Crowsnest.
- 117-D In west end of south face of small concrete arch culvert under Canadian Pacific railway, at mileage 24.2 from Crowsnest.
- 118-D In north face of west concrete abutment—10 inches below seat of I-beams—of open culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles east of Hosmer and at mileage 26.2 from Crowsnest.
- 119-D In east end of north face of concrete arch culvert under Canadian Pacific railway,  $1\frac{1}{2}$  miles west of Hosmer and at mileage 29.6 from Crowsnest.
- 120-D In south face of concrete retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway,  $3\frac{1}{2}$  miles east of Fernie and at mileage 32.6 from Crowsnest.
- 121-D In third course of stonework below water-table course, in east face of corner stone at southeast corner of Fernie post-office.
- 122-D In north concrete foundation wall—4 feet below brickwork and 8 feet from northeast corner—of Provincial Government building at Fernie.
- 123-D In side of concrete bench-mark pier, 3 feet south of north line of Canadian Pacific railway right-of-way, 180 feet west of a highway crossing, 1 mile west of Fernie and 330 feet west of mile-post 37 from Crowsnest.
- 124-D In north face of east concrete abutment—20 inches below seat of I-beams—of open culvert under Canadian Pacific railway, at mileage 39.8 from Crowsnest.

- 125-D In south face of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $\frac{1}{4}$  mile east of Morrissey and at mileage 43.5 from Crownsnest.
- 126-D In north face of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $2\frac{1}{2}$  miles west of Morrissey and at mileage 46.7 from Crownsnest.
- 127-D In north face of concrete retaining wall behind west abutment—4 feet 10 inches above bridge-seat—of through-truss bridge over Elk river,  $1\frac{1}{2}$  miles east of Elko.
- 128-D In west face of exposed rock surface, 55 feet south of north line of Canadian Pacific railway right-of-way, 1,740 feet east of mile-post 57 from Crownsnest and 100 feet west of a rock cut.
- 129-D In west end of north face of concrete arch culvert under Canadian Pacific railway, in a deep fill, 250 feet west of westerly switch of Caithness passing-track and at mileage 59.1 from Crownsnest.
- 130-D In north face of west concrete abutment—6 inches below bridge-seat—of plate-girder bridge on Canadian Pacific railway, 3 miles east of Jaffray and at mileage 63.8 from Crownsnest.
- 131-D In south face of southwest concrete retaining wall—3 feet 6 inches below bridge-seat—of plate-girder bridge on Canadian Pacific railway, at easterly switch of passing-track at Jaffray.
- 132-D In south concrete foundation wall—20 inches below woodwork and 7 inches from southwest corner—of Jaffray public school.
- 133-D In south concrete foundation wall—9 inches below woodwork and 14 inches from southwest corner—of Canadian Pacific section-house at Colvalli.
- 134-D In side of concrete bench-mark pier, 5 feet east of west line of Canadian Pacific railway right-of-way and 100 feet south of mile-post 5 from Colvalli.
- 135-D In south face of south concrete pier—6 inches below top of pier and 2 feet east of easterly girder—of Canadian Pacific railway bridge over Bull river,  $\frac{1}{2}$  mile north of Bull River station.
- 136-D In south face of large square boulder on east bank of Kootenay river, 42 feet west of centre line of Canadian Pacific railway track and 560 feet north of mile-post 14 from Colvalli.
- 137-D In north face of large flat mass of rock on east bank of Kootenay river, 28 feet west of centre line of Canadian Pacific railway track, 600 feet south of Steele south mile-board and between fourteenth and fifteenth telegraph poles north of mile-post 21 from Colvalli.
- 138-D In rear (or east) concrete foundation wall—1 foot below woodwork and 7 feet south of rear entrance—of Canadian Pacific station-house at Steele.
- 139-D In north (vertical) face of large white boulder, 40 feet west of centre line of Canadian Pacific railway track 520 feet south of a whistle-post for southbound trains and 2060 feet south of mile-post 26 from Colvalli.
- 140-D In north face of large irregular boulder, 15 feet east of Canadian Pacific railway track—in the side of a gravelly cut—150 feet north of a whistle-post for southbound trains and between eighth and ninth telegraph poles north of mile-post 29 from Colvalli.
- 141-D In side of concrete bench-mark pier—2 feet east of west line of Canadian Pacific railway right-of-way—450 feet north of highway crossing at northerly end of Wasa passing-track and between fourth and fifth telegraph poles south of mile-post 36 from Colvalli.
- 142-D In south face of concrete retaining wall behind east abutment—2 feet above bridge-seat—of Canadian Pacific railway bridge over Kootenay river, 3 miles north of Wasa.
- 143-D In northwest face of large black boulder, 80 feet east of east line of Canadian Pacific railway right-of-way and between seventeenth and eighteenth telegraph poles south of mile-post 44 from Colvalli.

- 144-D In south face—3 feet 2 inches below top and 4 feet from east end—of north concrete abutment of steel truss bridge over Skookumchuck creek, at mileage 46.6 from Colvalli.
- 145-D In east face of outcrop of rock, 60 feet west of west line of Canadian Pacific railway right-of-way, 1,250 feet south of a highway crossing and between second and third telegraph poles south of mile-post 50 from Colvalli.
- 146-D In west face of small rock exposure, 20 feet west of east line of Canadian Pacific railway right-of-way, 310 feet south of a whistle-post for southbound trains and between seventh and eighth telegraph poles south of mile-post 54 from Colvalli—opposite the centre of a high rocky hill immediately east of track.
- 147-D In south face—1 foot below top and 5 feet from west end—of north concrete abutment of steel truss bridge on Canadian Pacific railway, at mileage 59.7 from Colvalli.
- 148-D In east face of exposed rock surface, 20 feet west of Canadian Pacific railway track and 115 feet north of mile-post 62 from Colvalli.
- 149-D In exposed rock surface—20 feet west of Canadian Pacific railway track and near rail level—210 feet south of a rock cut and between sixth and seventh telegraph poles north of mile-post 65 from Colvalli.
- 150-D In side of concrete bench-mark pier, 3 feet east of west line of Canadian Pacific railway right-of-way, 18 feet north of a whistle-post for southbound trains and between sixteenth and seventeenth telegraph poles south of mile-post 75 from Colvalli—about 200 feet north of a small inlet which the railway has cut off from Columbia lake.
- 151-D Destroyed.
- 152-D In side of concrete bench-mark pier, 2 feet east of west line of Canadian Pacific railway right-of-way, 1,000 feet north of a private crossing and 730 feet south of bridge over small brook at mileage 86.7 from Colvalli.
- 153-D In south concrete foundation wall—2 feet 9 inches below woodwork and 1 foot 5 inches from southeast corner—of Canadian Pacific section-house at Athalmer,  $\frac{1}{2}$  mile south of the station.
- 154-D In east end of north face of concrete retaining wall behind south abutment—1 foot above bridge-seat—of Canadian Pacific railway swing bridge over a channel of Columbia river,  $1\frac{1}{2}$  miles north of Athalmer and at mileage 94.2 from Colvalli.
- 155-D In north face of boulder on east bank of Columbia river, 85 feet west of Canadian Pacific railway track and between fifteenth and sixteenth telegraph poles south of mile-post 99 from Colvalli—opposite the centre of a steep gravelly bank lying on east side of track.
- 156-D In side of concrete bench-mark pier, 3 feet west of east line of Canadian Pacific railway right-of-way, 1,240 feet north of northerly switch of Edgewater passing-track, 140 feet north of a galvanized iron culvert and 400 feet north of north end of a vertical clay bank about 100 feet in height lying on east side of track.
- 157-D In side of concrete bench-mark pier, 2 feet west of east line of Canadian Pacific railway right-of-way, 27 feet south of a gate in the right-of-way fence and between fourth and fifth telegraph poles north of mile-post 115 from Colvalli.
- 158-D In side of concrete bench-mark pier, 2 feet west of east line of Canadian Pacific railway right-of-way, 760 feet south of a private crossing,  $2\frac{1}{2}$  miles south of Spillimacheen and between eighth and ninth telegraph poles south of mile-post 123 from Colvalli.
- 159-D In south concrete foundation wall—8 inches below woodwork and 22 inches from southwest corner—of Canadian Pacific section-house at Spillimacheen.
- 160-D In south concrete foundation wall—8 inches below woodwork and 2 feet from southwest corner—of Canadian Pacific section-house at south end of Harrogate passing-track.
- 161-D In side of concrete bench-mark pier, 3 feet west of east line of Canadian Pacific railway right-of-way, 25 feet north of a private crossing and 320 feet north of mile-post 140 from Colvalli.



- 162-D In concrete foundation—4 inches below woodwork and 2 feet to the right of the doorway—of Canadian Pacific water-tank at Parson
- 163-D In west concrete foundation wall—4 inches below woodwork and 2 feet from southwest corner—of Canadian Pacific section-house at Parson
- 164-D In west concrete foundation wall—4 inches below woodwork and 3 feet from southwest corner—of Canadian Pacific section-house at Mons
- 165-D In side of concrete bench-mark pier, 3 feet west of east line of Canadian Pacific railway right-of-way, 250 feet north of a rock cut and 750 feet north of mile-post 160 from Colvill
- 166-D In north concrete foundation wall—11 inches below woodwork and 18 inches from northeast corner—of Canadian Pacific section-house at Nicholson
- 273-C In Canadian Pacific railway bridge over Kicking Horse river at Golden—see line from Field to Revelstoke.

BENCH-MARKS BETWEEN BULL RIVER AND KOOTENAY LANDING,  
B.C., VIA CANADIAN PACIFIC RAILWAY, WITH BRANCH  
LINE FROM CRESTON, B.C., TO PORTHILL, IDAHO,  
VIA GREAT NORTHERN RAILWAY.

*Elevations on page 307.*

Note.—These levels were carried across the Kootenay river from Bull River to a point on the railway near Wardner and thence westerly. The descriptions are written with the assumption that the railway runs in a westerly direction from Wardner to Creston and thence northerly to Kootenay Landing.

- 167-D In south side of rock cut on Canadian Pacific railway—80 feet from west end of cut—between ninth and tenth telegraph poles east of Tokay west mile-board,  $4\frac{1}{2}$  miles west of Wardner and at mileage 81.6 from Crowsnest
- 168-D In north face of boulder embedded in steep hillside, 100 feet south of south line of Canadian Pacific railway right-of-way,  $\frac{1}{2}$  mile east of Rampart flag-station and between tenth and eleventh telegraph poles west of mile-post 88 from Crowsnest
- 169-D In north side of rock cut on Canadian Pacific railway—30 feet from west end of cut and near rail level 400 feet east of a whistle-post for eastbound trains, 2 miles west of Rampart flag-station and at first telegraph pole east of mile-post 91 from Crowsnest
- 170-D In south face of exposed rock surface in side of steep hill, 20 feet north of Canadian Pacific railway track and 40 feet east of third telegraph pole east of mile post 94 from Crowsnest—this mile-post being at easterly switch of Eager passing-track
- 171-D In east end of north face—3 feet below top—of concrete arch culvert under Canadian Pacific railway, 2 miles east of Cranbrook and at mileage 96.9 from Crowsnest
- 172-D In east end of north face—18 inches below top—of concrete arch culvert under Canadian Pacific railway, 1,600 feet east of Cranbrook station
- 173-D In third course of stonework above concrete sidewalk, in centre of south (or Baker street) wall of Imperial Bank at Cranbrook
- 174-D In second course of stonework below brickwork, in north (or Baker street) wall of Cranbrook post-office—2 feet west of west wall of clock tower
- 175-D In east end of north face—45 inches below top—of concrete arch culvert under Canadian Pacific railway, in a ravine, 24 miles west of Cranbrook.

- 176-D In side of concrete bench-mark pier, 10 feet south of north line of Canadian Pacific railway right-of-way, 670 feet east of easterly switch of Fassiferne passing-track and 30 feet west of third telegraph pole west of mile-post 5 from Cranbrook.
- 177-D In west end of south face of square concrete culvert under Canadian Pacific railway, 150 feet east of easterly switch of Swansea passing-track and at mileage 9.3 from Cranbrook.
- 178-D In south end of west face of concrete retaining wall behind east abutment of plate-girder bridge over Moyie river, at mileage 10.9 from Cranbrook.
- 179-D In north face of concrete retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway, at mileage 13.3 from Cranbrook.
- 180-D In north face of exposed rock surface—immediately south of Canadian Pacific railway track and 2 feet above rail level—170 feet west of a permanent slow-sign for westbound trains, 3 miles east of Moyie and between fifth and sixth telegraph poles east of mile-post 17 from Cranbrook.
- 181-D In north end of west face of concrete retaining wall behind east abutment of open culvert under Canadian Pacific railway, 0.3 mile east of Moyie.
- 182-D In south face of concrete retaining wall behind east abutment—3 feet above bridge-seat—of plate-girder bridge over Moyie river, 2½ miles west of Moyie and at mileage 22.5 from Cranbrook.
- 183-D In north end of west face of concrete retaining wall behind east abutment of open culvert under Canadian Pacific railway, at mileage 25.8 from Cranbrook.
- 184-D In south end of east face of concrete retaining wall behind west abutment of open culvert under Canadian Pacific railway, at mileage 29.2 from Cranbrook.
- 185-D In south face—8 inches below top—of concrete retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway, at mileage 31.9 from Cranbrook.
- 186-D In north face of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway, 3¼ miles east of Yahk and at mileage 37.4 from Cranbrook.
- 187-D In west face of south face-wall of small concrete arch culvert under Canadian Pacific railway, 470 feet west of Yahk east mile-board and at mileage 39.6 from Cranbrook.
- 188-D In side of concrete bench-mark pier, 9 feet south of north line of Canadian Pacific railway right-of-way, 100 feet west of a whistle-post for eastbound trains, 3 miles west of Yahk and 540 feet east of a concrete arch culvert at mileage 43.7 from Cranbrook.
- 189-D In north end of west face of concrete retaining wall behind east abutment of open culvert under Canadian Pacific railway, at mileage 46.5 from Cranbrook.
- 190-D In west face—1 foot below top—of south face-wall of concrete arch culvert under Canadian Pacific railway, at mileage 50.8 from Cranbrook.
- 191-D In south face—immediately above southwest wing-wall—of concrete arch culvert under Canadian Pacific railway, 2¼ miles east of Cadorna and at mileage 53.1 from Cranbrook.
- 192-D In north face of concrete retaining wall behind east abutment of two-span open culvert under Canadian Pacific railway, immediately west of Cadorna.
- 193-D In south face—immediately above southwest wing-wall—of concrete arch culvert under Canadian Pacific railway, in a deep fill at an old saw-mill, 3 miles west of Cadorna and at mileage 58.5 from Cranbrook.
- 194-D In north face—14 inches below top—of a concrete pedestal used in connection with electric signal system. The pedestal is on north side of Canadian Pacific railway track, 20 feet east of east end of bridge over Goat river canyon and ½ mile west of Canyon station.

- 195 D In concrete footing 48 inches below woodwork and 18 feet to the left of the spout of Canadian Pacific water-tank at Creston.
- 196 D In west face of small boulder 30 feet east of west line of Canadian Pacific railway right-of-way, 160 feet south of a farm crossing  $\frac{1}{4}$  mile north of Creston and between tenth and eleventh telegraph poles north of mile-post 68 from Cranbrook.
- 197 D In east side of rock cut on Great Northern railway—near south end of cut—780 feet north of north end of trestle No. 14 and  $3\frac{1}{2}$  miles north of Porthill, Idaho.
- 198 D In north face of concrete base of international boundary monument No. 207, on top of hill, immediately east of Great Northern railway at Porthill.
- 199 D In south end of east face of concrete arch culvert under Canadian Pacific railway,  $1\frac{1}{4}$  miles north of Creston and at mileage 69.2 from Cranbrook.
- 200 D In east face—immediately above southeast wing-wall—of concrete arch culvert under Canadian Pacific railway, 1 mile south of Duck Creek flagstation and at mileage 72.7 from Cranbrook.
- 201 D In east side of rock cut on Canadian Pacific railway—25 feet from north end of cut and near rail level— $3\frac{1}{2}$  miles south of Sirdar and 190 feet north of mile-post 76 from Cranbrook.
- 202 D In west face of exposed rock surface—immediately west of Canadian Pacific railway track and near rail level— $1\frac{1}{4}$  miles south of Sirdar and at first telegraph poles south of mile-post 78 from Cranbrook.
- 203 D In south end of east face of small concrete arch culvert under Canadian Pacific railway, 0.6 mile north of Sirdar and at mileage 80.4 from Cranbrook.
- 204 D In side of concrete bench-mark pier, 35 feet west of Canadian Pacific railway track—33 feet north of northerly switch of Arbara passing-track and 890 feet southeast of east end of steel bridge over Kootenay river. This bench-mark is about midway between Sirdar and Kootenay.
- 205 D In west side of large rock cut on Canadian Pacific railway—near rail level—660 feet south end of steel truss bridge over Kootenay river and 10 feet north of point at which abandoned Great Northern railway to Kuskokwam diverges from Canadian Pacific railway, 200 feet north of point of rock separating the two tracks. This bench-mark is about midway between Sirdar and Kootenay Landing.

BENCH-MARKS BETWEEN FIELD AND REVELSTOKE, B.C.,  
VIA CANADIAN PACIFIC RAILWAY.

*Elevations on page 309*

- 261 C In east end of north face of capstone on northeast retaining wall of plate-girder bridge on Canadian Pacific railway, at mileage 3.8 from Field.
- 262 C In east end of south concrete face wall of tile pipe culvert under Canadian Pacific railway, at mileage 6.17 from Field.
- 263 C In north end of west face of concrete retaining wall behind east abutment of through-truss bridge over Kicking Horse river, Field west of Osoyoos at mileage 9.25 from Field.
- 264 C In south face—on top course of stop-work—of retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway, at mileage 11.56 from Field.
- 265 C In west end of south face of square concrete culvert under Canadian Pacific railway, 1 mile east of Leachford and at mileage 16.4 from Field.

- 266-C In east end of north concrete face-wall of tile culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles west of Leech-choil and at mileage 19.45 from Field.
- 267-C In south end of east face—in top course of stonework—of retaining wall behind east abutment of through-truss bridge over Kicking Horse river, at mileage 21.6 from Field.
- 268-C In north face of southeast retaining wall of tunnel on Canadian Pacific railway at mileage 21.5 from Field. The bench-mark is 2 feet above ground and 47 feet east of head-wall at eastern portal of tunnel.
- 269-C In second course of stonework above bridge-seat, in north end of west face of retaining wall behind east abutment of deck-truss bridge over Kicking Horse river,  $2\frac{1}{2}$  miles east of Glenogle and at mileage 25.7 from Field.
- 270-C In first course of stonework below coping, in west end of north face of stone arch bridge on Canadian Pacific railway,  $\frac{1}{2}$  mile east of Glenogle and at mileage 27.25 from Field.
- 271-C In west face of concrete head-wall at western portal of tunnel on Canadian Pacific railway, 3 miles west of Glenogle and at mileage 31.08 from Field. The bench-mark is near rail level and 1 foot 6 inches south of south side of tunnel.
- 272-C In centre of south face of stone coping on southeast retaining wall of through-truss bridge over Kicking Horse river, 2 miles east of Golden and at mileage 33.24 from Field.
- 273-C In northeast face of concrete retaining wall behind southeast abutment—2 feet 7 inches above bridge-seat of two-span truss bridge over Kicking Horse river, 0.3 mile east of Golden—on Kootenay Central subdivision of Canadian Pacific railway.
- 274-C In south face of concrete retaining wall behind east abutment of plate-girder bridge on Canadian Pacific railway,  $1\frac{1}{4}$  miles west of Golden and at mileage 36.93 from Field.
- 275-C In east end of north concrete face-wall of galvanized iron pipe culvert under Canadian Pacific railway  $3\frac{1}{4}$  miles west of Golden and at mile-post 39 from Field.
- 276-C In side of concrete bench-mark pier, 47 feet north of Canadian Pacific railway main track, 2,175 feet west of Moberly station-house and 153 feet west of mile-post 42 from Field.
- 277-C In east end of south face of stone coping on southeast retaining wall of through-truss bridge over Blaeberry river, at mile-post 45 from Field.
- 278-C In east end of north concrete face-wall of tile pipe culvert under Canadian Pacific railway, at mileage 48.2 from Field.
- 279-C In west end of north concrete face-wall of tile pipe culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile east of Donald and at mileage 51.23 from Field.
- 280-C In second course of stonework above bridge-seat, in north end of west face of retaining wall behind east abutment of plate-girder bridge over Columbia river, 1 mile west of Donald.
- 281-C In north face of southeast retaining wall of tunnel on Canadian Pacific railway,  $2\frac{1}{2}$  miles west of Donald and at mileage 54.32 from Field. The bench-mark is 2 feet above ground and 15 feet east of head-wall at eastern portal of tunnel.
- 282-C In south face of northeast retaining wall of tunnel on Canadian Pacific railway, at mileage 57.81 from Field. The bench-mark is 2 feet above ground and 27 feet east of head-wall at eastern portal of tunnel.
- 283-C In face of northwest wing-wall of square concrete culvert under Canadian Pacific railway, at mileage 59.25 from Field.
- 284-C In south end of west face of retaining wall behind east abutment of plate-girder bridge over Quartz creek, immediately east of Beavermouth.

285. C In second course of stonework above bridge seat on south face of retaining wall behind east abutment of through-truss bridge over Beaver river, 3 miles west of Beaver mouth.
286. C In west face of concrete retaining wall behind east abutment of plate-girder bridge over Sixmile creek, at mileage 68.3 from Field. The bench-mark is 1 foot 4 inches below top of concrete—between guard-rail and southerly girder.
287. C In east end of north face of coping on north end of stone arch culvert under Canadian Pacific railway,  $1\frac{1}{4}$  miles east of Sturdee and at mileage 72.1 from Field.
288. C In east end of south face of coping on south end of stone arch culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile west of Sturdee and at mileage 74.1 from Field.
289. C In east end of north face of stone coping on northeast retaining wall of Canadian Pacific railway bridge over Stony creek,  $\frac{1}{2}$  miles east of Bear Creek station and at mileage 76.1 from Field.
290. C In west end of south face of coping on south end of stone arch culvert under Canadian Pacific railway, 2 miles west of Bear Creek station and at mile-post 80 from Field.
291. C In east face of coping on south end of concrete arch culvert under Canadian Pacific railway, 1 mile east of Rogers Pass station and at mileage 83.26 from Field.
292. C Top of concrete bench-mark pier of abandoned grade lying immediately to the north of present 1915 track of Canadian Pacific railway, 2 miles 84 feet north of present track, 300 feet east of east end of a snowshed 1 mile west of Rogers Pass station and 97 feet east of mile-post 85 from Field.
293. C In north face of wall of double pipe culvert under Canadian Pacific railway,  $1\frac{1}{4}$  miles east of Glacier station and at mile-post 86 from Field.
294. C In east end of north face of coping on north end of stone arch culvert under Canadian Pacific railway, at mileage 87.1 from Field, immediately behind platform of Glacier station.
295. C In north face of stone coping on north-west retaining plate-girder bridge on Canadian Pacific railway at Canby, mileage 90.1 from Field.
296. C In wall west face of south-east concrete wing wall, 1 foot above bridge seat of through-truss bridge over Hiccalwee river,  $1\frac{1}{4}$  miles west of Canby and at mileage 91.84 from Field.
297. C In south face of stone coping on southeast retaining wall of through-truss bridge over Hiccalwee river,  $\frac{1}{2}$  mile west of Ross Peak station and at mileage 94.7 from Field.
298. C Top of pier of stonework on south end of west face of retaining wall behind west abutment of through-truss bridge over Hiccalwee river,  $\frac{1}{2}$  mile west of Ross Peak and at mileage 97.6 from Field.
299. C In east end of bench-mark of double pipe concrete culvert under Canadian Pacific railway,  $3\frac{1}{4}$  miles east of Hiccalwee and at mileage 99.6 from Field.
300. C In top of pier of stonework on north-east face of retaining wall behind east abutment of deck-truss bridge over Hiccalwee river, immediately behind the river and at mileage 102.2 from Field.
301. C In top of pier of stonework on east face of retaining wall of stone arch bridge on Canadian Pacific railway,  $1\frac{1}{4}$  miles west of Hiccalwee and at mile-post 104 from Field.
302. C In concrete wall face of double pipe concrete culvert under Canadian Pacific railway,  $1\frac{1}{4}$  miles east of Albert Canyon and at mileage 107.1 from Field.
303. C In south face of bench-mark on north-east face of retaining wall behind east abutment of plate-girder bridge on Canby. The bench-mark is immediately west of Albert Canyon station.

- 304 C In east face of concrete head-wall at eastern portal of tunnel on Canadian Pacific railway,  $1\frac{1}{2}$  miles west of Albert Canyon and at mileage 110.75 from Field. The bench-mark is 2 feet above ground and 8 inches north of north side of tunnel.
- 305 C In east end of north face-wall of concrete tile culvert under Canadian Pacific railway, at mileage 114.35 from Field—150 feet east of telephone house at Laurette.
- 306 C In north end of west face of concrete retaining wall behind east abutment—1 foot 6 inches above bridge-seat of plate-girder bridge on Canadian Pacific railway,  $1\frac{1}{2}$  miles east of Twin Butte and at mile-post 118 from Field.
- 307 C In west end of south face—4 feet below top—of square concrete culvert under Canadian Pacific railway, 0.4 mile west of Twin Butte and at mileage 119.9 from Field.
- 308 C In first course of stonework below bridge-seat, in west face—4 feet from south end—of east abutment of plate-girder bridge on Canadian Pacific railway,  $3\frac{1}{2}$  miles west of Twin Butte and at mileage 123.3 from Field.
- 309 C In north face of solid rock cliff—adjacent to a rocky mountain—130 feet south of Canadian Pacific railway track,  $4\frac{1}{2}$  miles east of Revelstoke and 1,600 feet east of mile-post 123 from Field.
- 310 C In east face of mass of rock, 47 feet north of Canadian Pacific railway track,  $2\frac{1}{2}$  miles east of Revelstoke and at mileage 127.15 from Field.
- 311 C In second course of stonework below brickwork, in east wall of Canadian Pacific station-house at Revelstoke, 16 feet from southeast corner of building.
- 312 C In west end of north face of small square concrete culvert under Canadian Pacific railway, 1,600 feet west of station and 35 feet west of west line of Campbell avenue, Revelstoke.
- 313 C In east concrete foundation wall—6 feet below brickwork and 4 feet from northeast corner—of Revelstoke high school, on south side of Second street.
- 314 C In first course of stonework below basement window sills, in north wall of Revelstoke court-house, 4 feet from northeast corner of building.

BENCH-MARKS BETWEEN EDMONTON AND JASPER, ALTA.  
VIA GRAND TRUNK PACIFIC RAILWAY

*Elevations on page 311*

- 62 H In south face of concrete footing of semaphore on north side of Grand Trunk Pacific railway track. This is the first (or home) semaphore east of diamond crossing of Canadian Northern railway,  $\frac{1}{2}$  mile east of Bissett.
- 63 H In side of concrete bench-mark pier, 4 feet south of north line of Grand Trunk Pacific railway right-of-way, 1,200 feet east of a highway crossing,  $1\frac{1}{2}$  miles east of Acheson and 2.5 miles east of mile-post 800 from Winnipeg.
- 64 H In south concrete foundation wall—1 foot below woodwork and 8 inches from southwest corner—of front (or southerly) section of Sprucegrove public school.
- 65 H In north concrete foundation wall—6 inches below woodwork and 20 feet from northwest corner—of planing mill at Stonyplain, immediately south of Grand Trunk Pacific railway.
- NOTE.—This bench-mark has been rendered inaccessible by a covered driveway constructed along north side of building.

- 66 H. In side of concrete benchmark pier 7 feet south of north line of Grand Trunk Pacific railway right-of-way, 275 feet east of mile-post 822 from Winnipeg,  $1\frac{1}{2}$  miles west of Stonyplain and at twenty-first telegraph pole east of a highway crossing.
- 67 H. In concrete foundation 5 inches below woodwork and 3 feet 6 inches to the right of the spout—of Grand Trunk Pacific water-tank 0.6 mile west of Carvel.
- 68 H. In side of concrete benchmark pier 5 feet south of north line of Grand Trunk Pacific railway right-of-way, 18 feet west of a farm crossing, 1 mile west of Daffield and between fifth and sixth telegraph poles east of mile-post 863 from Winnipeg.
- 69 H. In east concrete foundation wall 3 feet below woodwork and 8 inches from southeast corner—of Wabamun hotel, Wabamun.
- 70 H. In side of concrete benchmark pier 36 feet south of Grand Trunk Pacific railway track,  $1\frac{1}{2}$  miles west of Fullerton 16 feet east of fifth telegraph pole west of mile-post 847 from Winnipeg—at east side of small gulch which crosses track in centre of a long clay cut.
- 71 H. In concrete foundation 4 feet below woodwork and 2 feet to the right of the spout—of Grand Trunk Pacific water-tank at Garford.
- 72 H. In concrete foundation of concrete retaining wall behind east abutment 4 feet 8 inches above bridge-seat of bridge over Longview Fork of River, 1 mile west of Entwistle.
- 73 H. In side of concrete benchmark pier 4 feet north of south line of Grand Trunk Pacific railway right-of-way, 40 feet west of a farm crossing,  $2\frac{1}{4}$  miles east of Jenkins and 60 feet east of mile-post 868 from Winnipeg.
- 74 H. In side of concrete benchmark pier 3 feet south of north line of Grand Trunk Pacific railway (or south line of Canadian Northern railway) right-of-way, 100 feet west of a gate in the right-of-way fence, 220 feet west of mile-post 87 from Winnipeg and opposite eleventh telegraph pole east of C.N.R. mile-post 87 from Edmonton.
- 75 H. In west concrete foundation below top of concrete footing of semaphore on north side of Grand Trunk Pacific railway track. This is the first of four semaphores east of main crossing of Canadian Northern railway,  $1\frac{1}{4}$  miles east of Fort Assiniboia and  $1\frac{1}{2}$  miles west of C.N.R. station at Chaplaine.
- 76 H. In concrete foundation 4 inches below woodwork and directly beneath the spout—of Grand Trunk Pacific water-tank  $1\frac{1}{4}$  miles west of Leduc.
- 77 H. In side of concrete benchmark pier 49 feet north of Grand Trunk Pacific railway track, 2 miles east of Fullerton 16 feet east of mile-post 841 from Winnipeg.
- 78 H. In concrete foundation 4 inches below woodwork and directly beneath the spout—of Grand Trunk Pacific water-tank 2 miles west of Colley.
- 79 H. In concrete benchmark pier 45 feet south of Grand Trunk Pacific railway track, 920 feet east of a small stream crossing,  $2\frac{1}{4}$  miles east of Rockyview and between fifth and sixth telegraph poles west of mile-post 860 from Winnipeg.
- 80 H. In side of concrete foundation 3 feet below top of concrete retaining wall behind west abutment of steel trestle bridge over McLeod river, 1 mile east of Yarrow.
- 81 H. In concrete foundation wall 5 feet 6 inches below brickwork and 5 inches from southwest corner—of Leduc public school.
- 82 H. In concrete foundation 5 inches below woodwork and 3 feet to the left of the spout—of Grand Trunk Pacific water-tank at Leduc 1 mile west of the bridge.

- 83-H In northwest face of west concrete retaining wall of north abutment of bridge by which Grand Trunk Pacific railway passes over Canadian Northern railway,  $6\frac{1}{2}$  miles west of Edson. The bench-mark is 3 feet below G.T.P. rails and 4 feet 6 inches from northerly end of retaining wall—it being assumed that the G.T.P. railway at this point runs in a southwesterly direction.
- 84-H In side of concrete bench-mark pier, 52 feet south of Grand Trunk Pacific railway track—at west end of a long clay cut—between fifth and sixth telegraph poles east of mile-post 935 from Winnipeg and opposite a point between twelfth and thirteenth poles east of C.N.R. mile-post 12 from Tollerton.
- 85-H In side of concrete bench-mark pier, 35 feet south of Grand Trunk Pacific railway track at mile-post 941 from Winnipeg—opposite a point between sixth and seventh telegraph poles east of C.N.R. mile-post 18 from Tollerton.
- 86-H In concrete foundation—5 inches below woodwork and 3 feet 6 inches to the right of the spout—of Grand Trunk Pacific water-tank at Medicine Lodge.
- 87-H In side of concrete bench-mark pier, 60 feet south of Grand Trunk Pacific railway track and between seventh and eighth telegraph poles east of mile-post 957 from Winnipeg—on top of a gently sloping bank about 300 feet east of east end of a curve.
- 88-H In north side of sandstone rock cut on Grand Trunk Pacific railway—100 feet from west end of cut—620 feet east of east end of a trestle bridge,  $1\frac{1}{2}$  miles east of Roundcroft and 37 feet east of eighth telegraph pole west of mile-post 962 from Winnipeg.
- 89-H In southwest face of smooth white boulder, 20 feet north of Grand Trunk Pacific railway track—in the side of a long clay cut—1 mile west of Roundcroft and at mile-post 965 from Winnipeg.
- 90-H In side of concrete bench-mark pier, 40 feet north of south line of Grand Trunk Pacific railway right-of-way—200 feet west of west end of a trestle bridge, 0.6 mile west of Peasley and between third and fourth telegraph poles east of mile-post 971 from Winnipeg.
- 91-H In circular concrete base of inlet pipe of steel water-tank on Grand Trunk Pacific railway, at west end of Hinton passing-track. The bench-mark faces south.
- 92-H In south end of east face of concrete retaining wall behind west abutment—4 feet 6 inches above bridge-seat of long steel trestle bridge over Prairie creek, 3 miles west of Hinton.
- 93-H In south side of deep rock cut on Grand Trunk Pacific railway—near west end of cut and at rail level—1 mile west of Dyke and 12 feet west of mile-post 984 from Winnipeg. This is on a quarter-mile section of straight track about midway between two sharp curves.
- 94-H In northwest face of vertical rock surface—20 feet south of Grand Trunk Pacific railway track and at the 1 mile post—12 feet east of mile-post 987 from Winnipeg—about 300 feet west of a rock cut and at east end of a sharp curve on a straight track.
- 95-H In side of concrete bench-mark pier, 28 feet north of Grand Trunk Pacific railway track,  $\frac{1}{2}$  mile east of Parkgate and 12 feet east of mile-post 994 from Winnipeg—on a small point of land on shore of Brûlé lake.
- 96-H In south end of west face of concrete retaining wall behind east abutment—4 feet 3 inches above bridge-seat—of truss bridge over Fiddle creek, at mileage 997.5 from Winnipeg.
- 97-H In south side of long curved rock cut on Grand Trunk Pacific railway—150 feet from west end of cut and 1 mile west of Peahontus,  $\frac{1}{2}$  mile east of a lime kiln and between fifteenth and sixteenth telegraph poles east of mile-post 1004 from Winnipeg.
- 98-H In north end of west face of concrete retaining wall behind east abutment—5 feet above bridge-seat—of through-truss bridge over Rocky river,  $\frac{1}{2}$  mile east of Hawes.
- 99-H In south side of rock cut on Grand Trunk Pacific railway, 60 feet west of a prominent point of rock—the highest point of the rock east of Esterhachen and between fifth and sixth telegraph poles east of mile-post 1011 from Winnipeg.



- 100 H In north end of west face of concrete retaining wall behind east abutment—5 feet above bridge-seat—of through-truss bridge over Athabaska river, at mileage 1015.1 from Winnipeg.
- 101 H In east face of concrete retaining wall behind west abutment—4 feet 4 inches above bridge-seat and immediately north of southerly truss—two-span truss bridge on Grand Trunk Pacific railway, 2 miles east of Henry House and at mileage 1017.2 from Winnipeg.
- 102 H In north end of east face of concrete retaining wall behind west abutment—4 feet 5 inches above bridge-seat—of bridge by which Grand Trunk Pacific railway crosses over Canadian Northern railway, 1 mile west of Henry House and at mileage 1020.3 from Winnipeg. This is at C.N.R. mile-post 99 from Tollerton.
- 103 H In north side of rock cut on Grand Trunk Pacific railway—70 feet from west end of cut, in projection of rock from cut—3½ miles east of Jasper, 30 feet west of fourth telegraph pole east of mile-post 1024 from Winnipeg and 100 yards west of C.N.R. water-tank at Maligne.
- 104 H In northeast corner of Jasper Park administration building, immediately west of Grand Trunk Pacific station at Jasper. The bench-mark is 1 foot above ground, in large stone in south face of buttress at southeast corner of a one-story extension from main building.

TABLE I-A.

BENCH-MARKS BETWEEN ST. STEPHEN, N.B., AND RIVIERE-DU-LOUP,  
QUE., VIA CANADIAN PACIFIC RAILWAY THROUGH BRUNSWICK,  
McADAM, AROOSTOOK AND EDMUNSTON; THENCE  
TEMISCOUATA RAILWAY TO RIVIERE-DU-LOUP.

*Elevations on page 313.*

**Note.**—These descriptions are written with the assumption that the railway runs in an easterly direction from St. Stephen to Brunswick, thence northerly to Grand Falls and thence northwesterly to Rivière-du-Loup.

- 1-B In northeast wall of rear section of City Building—on Church street—Calais, Maine. The bench-mark is 2 feet above ground and 3 feet 7 inches to the rear of front section of building.
- 2-B In first course of stonework below water-table course, in south end of east wall of Bank of British North America at St. Stephen, N.B.
- 3-B In first course of stonework below water-table course, in front (or north) wall of St. Stephen post-office—to the west of easterly doorway.
- 4-B In north face of large boulder, 10 feet south of Canadian Pacific railway track,  $\frac{1}{2}$  mile west of Oak Bay station and 1040 feet east of mile-post 5 from St. Stephen.
- 5-B In top course of stonework, in south face of east abutment of small plate-girder bridge on Canadian Pacific railway,  $4\frac{1}{2}$  miles west of Brunswick and 200 feet east of mile-post 10 from St. Stephen.
- 6-B In north face of boulder, 10 feet north of Canadian Pacific railway track and 200 feet west of diamond crossing at Brunswick.
- 7-B In east face of boulder, 25 feet west of Canadian Pacific railway track and at seventh telegraph pole north of mile-post 5 from Watt.
- 8-B In small boulder 8 feet east of west line of Canadian Pacific railway right-of-way, 65 feet north and 85 feet west of northwest corner of station-house at Watt.
- 9-B In boulder 18 feet east of Canadian Pacific railway track,  $4\frac{1}{2}$  miles north of Watt and 100 feet north of mile-post 10 from McAdam.
- 10-B In boulder 15 feet west of Canadian Pacific railway track and 390 feet south of mile-post 5 from McAdam—at north end of a small cut.
- 11-B In third course of stonework above platform, in north wall of Canadian Pacific station-house at McAdam, between fifth and sixth doorways from east end of building.
- 12-B In sixth course of stonework below bridge-seat, in north end of west face of east abutment of subway under main line of Canadian Pacific railway,  $5\frac{1}{2}$  miles west of McAdam and 330 feet east of bridge over St. Croix river.
- 13-B In third course of stonework below top, in south face of southeast retaining wall of bridge over St. Croix river, on main line of Canadian Pacific railway,  $5\frac{1}{2}$  miles west of McAdam.
- 14-B In west face of large mass of granite, 12 feet east of Canadian Pacific railway track, 580 feet north of northerly switch at Sugar Brook siding and between eleventh and twelfth telegraph poles north of mile-post 10 from McAdam.

- 15-B In south face of large granite boulder, 40 feet east of Canadian Pacific railway track, 180 feet south of northerly switch at Deer Lake siding and between twelfth and thirteenth telegraph poles north of mile-post 16 from McAdam.
- 16-B In northwesterly concrete footing under Canadian Pacific water-tank at Chatham.
- 17-B In exposed rock surface, 10 feet east of west line of Canadian Pacific railway right-of-way,  $\frac{1}{2}$  mile south of Scott, 20 feet south of a small gate in right-of-way fence and at tenth telegraph pole south of mile-post 27 from McAdam.
- 18-B In third course of stonework below top, in east end of south face of retaining wall behind north abutment of plate-girder bridge over Eel river, 300 feet south of Benton station.
- 19-B In east side of small rock cut on Canadian Pacific railway, 25 feet north of mile-post 37 from McAdam.
- 20-B In northwesterly concrete footing under Canadian Pacific water-tank at Debee.
- 21-B In south face of boulder, 15 feet north of Canadian Pacific railway track, Horton branch, 4-6 miles west of Debee and at twelfth telegraph pole east of international boundary monument No. 14-A.
- 22-B In north face of international boundary monument No. 14-A, 5 miles west of Debee, on Horton branch of Canadian Pacific railway.
- 23-B In top course of stonework in south end of west face of easterly footing of highway bridge over Canadian Pacific railway, 450 feet north of Teels Mill and at mileage 15.1 from McAdam.
- 24-B In south end of west face of coping on west end of stone arch culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile south of Woodstock.
- 25-B In second course of stonework below top, in south end of west face of southwest retaining wall of Canadian Pacific railway bridge over Meduxnekeag river at Woodstock.
- 26-B In second course of stonework above ground, in north end of west wall of Woodstock post-office.
- 27-B In third course of stonework below water-table course, in north end of east wall of Armoury at Woodstock.
- 28-B In south face—3 feet 3 inches below top—of concrete retaining wall behind east abutment of Canadian Pacific railway bridge over westerly channel of St. John river at Upper Woodstock.
- 29-B In north face of coping on east end of concrete arch culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles north of Newburg and at mileage 57.7 from McAdam.
- 30-B In third course of stonework below top, in north end of east face of southeast retaining wall of small bridge on Canadian Pacific railway, 2 $\frac{1}{2}$  miles south of Hartland.
- 31-B In second course of stonework above bridge-seat, in east corner south face of retaining wall behind north abutment of plate-girder bridge over Penagance river,  $\frac{1}{2}$  mile north of Hartland.
- 32-B In second course of stonework below capstone, in east face of south abutment of plate-girder bridge on Canadian Pacific railway, 450 feet north of Stickney station.
- 33-B In west face of exposed rock surface at east end of Canadian Pacific railway track, 120 feet south of a small culvert, 780 feet south of a farm crossing and  $\frac{1}{2}$  mile south of Horenceville.
- 34-B In west face of concrete retaining wall behind north abutment of plate-girder bridge on Canadian Pacific railway at Bristol.
- 35-B In third course of stonework below top, in south end of west face of southwest retaining wall of Canadian Pacific railway bridge over Monquart river,  $\frac{1}{2}$  mile north of Bath.

- 36-B In south end of west face of concrete arch culvert under Canadian Pacific railway, in a deep ravine, 1 mile north of Beechwood.
- 37-B In top course of stonework, in west end of south face of retaining wall behind north abutment of plate-girder bridge on Canadian Pacific railway, at Muniac flag-station—mileage 91.9 from McAdam.
- 38-B In south face of north concrete abutment—26 inches below bridge-seat—of small plate-girder bridge on Canadian Pacific railway, 1½ miles south of Perth.
- 39-B In north end of west face—19 inches below top—of concrete retaining wall behind east abutment of Canadian Pacific railway bridge over St. John river, between Perth and Andover.
- 40-B In south wall of Victoria county court-house at Andover—15 inches above water-table and 2 feet from southeast corner of building.
- 41-B In west face—9 inches below top—of concrete retaining wall behind south abutment of bridge over Aroostook river, ½ mile north of Aroostook, on Edmundston branch of Canadian Pacific railway.
- 42-B In south face of concrete base of international boundary monument No. 82, 4½ miles west of Aroostook, on Aroostook branch of Canadian Pacific railway.
- 43-B In boulder in field, 220 feet west of Canadian Pacific railway track (Edmundston branch) and 430 feet south of mile-post 5 from Aroostook—behind a small frame schoolhouse.
- 44-B In south face of small boulder, 15 feet west of Canadian Pacific railway track and 160 feet south of southerly switch at Limestone siding.
- 45-B In face of northeast wing-wall of concrete arch culvert under Canadian Pacific railway at Argosy flag-station—mileage 13.8 from Aroostook.
- 46-B In west wall of south transept of Grand Falls Roman Catholic church, in corner stone of fourth course below water-table.
- 47-B In east end of north face of concrete retaining wall behind north abutment of Canadian Pacific railway bridge over St. John river, 1½ miles north of Grand Falls.
- 48-B In southwest face of small concrete arch culvert under National Transcontinental railway, opposite a point on Canadian Pacific railway at tenth telegraph pole northwest of mile-post 24 from Aroostook.
- 49-B In northeast face of small concrete arch culvert under National Transcontinental railway, opposite a point on Canadian Pacific railway 2,100 feet northwest of mile-post 28 from Aroostook.
- 50-B In northeast face of concrete retaining wall behind southeast abutment of Canadian Pacific railway bridge over Grand river, 2½ miles northwest of St. Leonard and at mileage 33.4 from Aroostook.
- 51-B In easterly concrete footing under Canadian Pacific water-tank at Siegas.
- 52-B In northwest face of coping on northeast end of concrete arch culvert under National Transcontinental railway, opposite a point on Canadian Pacific railway at mileage 38.9 from Aroostook.
- 53-B In southwest concrete face-wall of tile culvert under National Transcontinental railway, opposite a point on Canadian Pacific railway at second telegraph pole northwest of mile-post 43 from Aroostook.
- 54-B In southwest end of southeast face—23 inches below top—of concrete retaining wall behind northwest abutment of Canadian Pacific railway bridge over Green river, ¼ mile southeast of Green River station.
- 55-B In northeast concrete face-wall of tile culvert under National Transcontinental railway, opposite a point on Canadian Pacific railway at eighth telegraph pole northwest of mile-post 50 from Aroostook.

- 56-B In southeast end of northeast face of concrete arch culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile southeast of St. Basil and between first and second telegraph poles northwest of mile-post 52 from Aroostook.
- 57-B In exposed rock surface in field, about 150 feet northeast of Canadian Pacific railway track, 2 miles southeast of Edmundston and opposite fifth telegraph pole northwest of mile-post 55 from Aroostook.
- 58-B In second course of stonework above bridge-seat, in east end of north face of northwest retaining wall of Temiscouata railway bridge over Madawaska river, at Edmundston.
- 59-B In face of northeast concrete wing-wall of subway under National Transcontinental railway, 300 feet west of bridge over Madawaska river, at Edmundston.
- 60-B In face of rock cut at north side of railway track, 140 feet west of west wall of Canadian Pacific station-house at Edmundston.
- 61-B In southwest face of cap-stone on south retaining wall of Temiscouata railway bridge over Madawaska river,  $2\frac{1}{2}$  miles northwest of Edmundston.
- 62-B In first course of stonework below water-table course, in south wall of Roman Catholic church at Ste. Rose, 10 feet from front (or east) wall of building.
- 63-B In southwest side of rock cut on Temiscouata railway—near centre of cut—435 feet southeast of a trestle bridge, 3 miles northwest of Ste. Rose and at ninth telegraph pole southeast of mile-post 57 from Rivière-du-Loup.
- 64-B In southwest side of rock cut on Temiscouata railway, 70 feet northwest of a blacksmith shop, 1 mile southeast of Notre-Dame-du-Lac and 220 feet northwest of mile-post 53 from Rivière-du-Loup.
- 65-B In northeast side of rock cut on Temiscouata railway, 2 miles northwest of Notre-Dame-du-Lac and 250 feet southeast of mile-post 50 from Rivière-du-Loup.
- 66-B In east face of granite boulder, 10 feet southwest of Temiscouata railway track,  $2\frac{1}{2}$  miles southeast of Cabano and at ninth telegraph pole northwest of mile-post 46 from Rivière-du-Loup.
- 67-B In northeast side of rock cut on Temiscouata railway—42 feet from northwest end of cut— $3\frac{1}{2}$  miles northwest of Cabano: this is the first rock cut northwest of Cabano.
- 68-B In west face of boulder, 6 feet northeast of northeast line of Temiscouata railway right-of-way,  $1\frac{1}{2}$  miles southeast of Vauban and opposite fifth telegraph pole southeast of mile-post 35 from Rivière-du-Loup.
- 69-B In exposed rock surface at northeast side of Temiscouata railway track,  $2\frac{1}{2}$  miles northwest of Vauban and 360 feet southeast of mile-post 31 from Rivière-du-Loup.
- 70-B In east face of small boulder, 9 feet northeast of Temiscouata railway track and  $\frac{1}{2}$  mile northwest of St. Honoré.
- 71-B In exposed rock surface at southwest side of Temiscouata railway track,  $4\frac{1}{2}$  miles northwest of St. Honoré and close to first telegraph pole southeast of mile-post 22 from Rivière-du-Loup.
- 72-B In northeast side of rock cut on Temiscouata railway—on curve at summit of grade— $3\frac{1}{2}$  miles southeast of Whitworth and  $\frac{1}{2}$  mile northwest of mile-post 20 from Rivière-du-Loup.
- 73-B In northeast side of shallow rock cut on Temiscouata railway,  $2\frac{1}{2}$  miles northwest of Whitworth and at first telegraph pole northwest of mile-post 14 from Rivière-du-Loup.
- 74-B In east face of large boulder, 25 feet northeast of Temiscouata railway track,  $1\frac{1}{2}$  miles southeast of Ste. Modeste and between fifteenth and sixteenth telegraph poles southeast of mile-post 8 from Rivière-du-Loup.
- 75-B In large piece of rock, 8 feet southwest of southwest line of Temiscouata railway right-of-way and 350 feet southeast of mile-post 3 from Rivière-du-Loup.

- 76-B In sixth course of stonework below bridge-seat, in northeast face of northwest abutment of Temiscouata railway bridge over rivière-du-Loup, 1 mile southeast of Rivière-du-Loup station.
- 77-B In second course of stonework below top, in north end of west face of northwest retaining wall of Intercolonial railway bridge over rivière-du-Loup, immediately north of Rivière-du-Loup station.  
NOTE.—In this description the railway is assumed to run north and south.
- 78-B In first course of stonework above water-table, in south wall of St. François-Xavier Roman Catholic church at Rivière-du-Loup, 3 feet 3 inches from front (or west) wall of building.

BENCH-MARKS BETWEEN BRUNSWICK AND ST. JOHN, N.B., VIA  
CANADIAN PACIFIC RAILWAY, SHORE LINE SUBDIVISION.

*Elevations on page 316.*

- 79-B In large piece of rock, 70 feet south of Canadian Pacific railway track, on east side of public highway,  $1\frac{1}{2}$  miles west of Dyer and at seventeenth telegraph pole west of mile-post 20 from St. Stephen.
- 80-B In south face of large boulder at south side of Canadian Pacific railway track,  $1\frac{1}{2}$  miles east of Dyer and at sixteenth telegraph pole west of mile-post 23 from St. Stephen.
- 81-B In north face of boulder, 8 feet south of Canadian Pacific railway track,  $1\frac{1}{2}$  miles west of Bonny River station and 65 feet east of mile-post 28 from St. Stephen.
- 82-B In exposed rock surface, 25 feet south of Canadian Pacific railway track,  $1\frac{1}{2}$  miles east of Bonny River station and 135 feet west of mile-post 31 from St. Stephen.
- 83-B In second course of stonework below woodwork, in front (or north) wall of Roman Catholic church at St. George—8 feet 6 inches from northeast corner of building.
- 84-B In boulder—8 feet by 12 feet—12 feet south of south line of Canadian Pacific railway right-of-way and  $\frac{1}{2}$  mile east of Utopia.
- 85-B In west face of vertical rock surface in side of rocky hill, 75 feet north of Canadian Pacific railway track and  $1\frac{1}{2}$  miles west of Pennfield.
- 86-B In boulder—6 feet by 8 feet—37 feet south of Canadian Pacific railway track, 3 miles west of Pocologan and 1,750 feet west of mile-post 48 from St. Stephen.
- 87-B In fourth course of stonework below concrete, in north end of west face of east abutment of Canadian Pacific railway bridge over Little New river,  $2\frac{1}{2}$  miles east of Pocologan.
- 88-B In east face of boulder, 16 feet south of Canadian Pacific railway track, 2 miles east of New River station and 2,400 feet west of mile-post 56 from St. Stephen.
- 89-B In second course of stonework below bridge-seat, in north face of east abutment of steel truss bridge over Lepreau river,  $\frac{1}{2}$  mile east of Lepreau.
- 90-B In south side of small rock cut on Canadian Pacific railway,  $3\frac{1}{2}$  miles east of Lepreau and 420 feet east of mile-post 62 from St. Stephen.
- 91-B In third course of stonework below bridge-seat, in south face of west abutment of Canadian Pacific railway bridge over west branch of Musquash river,  $1\frac{1}{2}$  miles west of Musquash.
- 92-B In south end of west face of block of concrete on top of east pier of swing span in Canadian Pacific railway bridge over east branch of Musquash river, 1 mile east of Musquash.

- 93-B In south side of rock cut on Canadian Pacific railway,  $2\frac{1}{2}$  miles east of Prince of Wales and 1,220 feet east of mile-post 72 from St. Stephen.
- 94-B In exposed rock surface at south side of Canadian Pacific railway track, 35 feet east of west end of rock and 1,400 feet east of Allan Cot station.
- 95-B In southwest corner of rocky hill, 33 feet north of north line of Canadian Pacific railway right-of-way, 1,500 feet west of Duck Cove station and immediately east of lane leading to St. John Aylum annex.
- 96-B In second course of stonework above bridge-seat, in north end of east face of retaining wall behind west abutment of steel trestle approach at Fairville end of cantilever bridge over St. John river—on Canadian Pacific railway—between Fairville and St. John.
- 97-B In first course of stonework above sidewalk, in south wall—immediately to the rear of portico—of St. John union station.
- 98-B In granite foundation stone of rear (or west) wall of St. John post-office, 16 inches from southwest corner of building.
- 99-B In second course of stonework above sidewalk, in south end of front (or east) wall of St. John custom-house.
- 100-B In water-table course of stonework, in centre of north wall of Nase's grocery store, at southwest corner of Bridge and Main streets—near Indiantown wharf—St. John.

BENCH-MARKS BETWEEN ROUSE POINT, N.Y., AND SHERBROOKE, QUE.,  
VIA GRAND TRUNK RAILWAY TO ST. JOHNS, QUE., AND  
CANADIAN PACIFIC RAILWAY THROUGH FARNHAM  
AND FOSTER TO SHERBROOKE

*Elevations on page 317.*

- ⊙ United States Coast and Geodetic Survey bench-mark in Chapman Block, Rouse Point.
- 81 In north stone abutment of plate-girder bridge on Grand Trunk railway,  $2\frac{1}{2}$  miles south of Lacolle Junction.
- 80 Destroyed.
- 79 In third course of stonework below water-table course, in north face of pilaster at northeast corner of Roman Catholic church at Stottsville.
- 78 In south face of corner-stone—second course above ground—at southwest corner of central section of Roman Catholic church at Grand Ligne.
- 77 In second course of stonework below top, in southeast face of southeast curved retaining wall of plate-girder bridge on Grand Trunk railway,  $1\frac{1}{2}$  miles south of St. Johns.
- 76 In water-table course of stonework, in west end of south wall of Grand Trunk station-house at St. Johns.
- 75 In third course of stonework below water-table course, in south end of west wall of St. Johns post-office.
- 74 In north end of east face of west concrete abutment—3 feet above roadway—of subway under Canadian Pacific railway, 200 feet east of bridge over Richelieu river, between St. Johns and Iberville.
- 73 Destroyed.
- 72 In boulder 15 feet south of Canadian Pacific railway track and 20 feet west of highway crossing at Versailles.
- 71 In boulder 25 feet north of Canadian Pacific railway track and 60 feet east of highway crossing at St. Brigide.

- 62 In top course of stonework, in east end of front (or south) wall of Canadian Pacific station-house at Farnham.
- 61 In second course of stonework below top, in southwest retaining wall of small bridge on Canadian Pacific railway, 3.1 miles west of Brookport.
- 60 In northeasterly concrete footing under Canadian Pacific water-tank at Brookport.
- 59 In boulder beside elm tree, 45 feet east and 100 feet south of southeast corner of Adamsville station-house.
- 58 In boulder 10 feet south of Canadian Pacific railway track, 3½ miles east of Adamsville and at second telegraph pole east of mile-post 118 from Megantic.
- 57 In west face of stone coping on northwest retaining wall of Canadian Pacific railway bridge over north branch of Yamaska river, 1¼ miles east of West Shefford.
- 56 In south side of rock cut on Canadian Pacific railway, 800 feet east of Fulford station and 230 feet east of mile-post 109 from Megantic.
- 47 In west foundation wall of Railroad hotel at Foster, 4 feet south of northwest corner of building.
- 46 In west face of stone coping on southwest retaining wall of plate-girder bridge on Canadian Pacific railway, 2 miles east of Foster and at mileage 103.7 from Megantic.
- 45 In south end of west face of east abutment of small concrete culvert under Canadian Pacific railway, ¼ mile east of South Stukely and at mileage 100.3 from Megantic.
- 44 In boulder 6 feet south of north line of Canadian Pacific railway right-of-way, 150 feet east of a tool house and 1,200 feet west of Eastray station.
- 43 In exposed rock surface on north side of Canadian Pacific railway track, 18 feet east of sixth telegraph pole west of mile-post 93 from Megantic.
- 42 In west face of stone coping on northwest retaining wall of Canadian Pacific railway bridge over Castle creek, 3 miles west of Magog and at mileage 89.8 from Megantic.
- 41 A In third course of stonework below water-table course, in west end of south wall of Magog post-office.
- 41 In second course of stonework above ground, in masonry base of Canadian Pacific water-tank at Magog, 15 feet to the right of the doorway underneath tank.
- 40 In boulder 200 feet south of southwest corner of Magog station-house, 50 feet west of main line of Canadian Pacific railway, and on south street line of road to Magog wharf.
- 39 In north end of west face of concrete retaining wall behind west abutment of plate-girder bridge on Canadian Pacific railway, 1¼ miles east of Magog and at mileage 85.4 from Megantic.
- 38 In boulder at north side of Canadian Pacific railway track, 1¼ miles west of Seaswan flag-station and close to culvert at mileage 79.23 from Megantic.
- 37 In east face of south face-wall of stone culvert under Canadian Pacific railway at mileage 74.5 from Megantic.
- 36 In east face of stone coping on southeast retaining wall of Canadian Pacific railway bridge over Magog river, about 1 mile west of Sherbrooke station.
- 35 In water-table course of stonework, in south end of west wall of old Canadian Pacific station-house at Sherbrooke—at the corner of Bellevue and Front streets.
- 1 In Sherbrooke post-office—see line from Sherbrooke to Norton Mills.



BENCH-MARKS BETWEEN FARNHAM AND INTERNATIONAL BOUNDARY  
NEAR ST. ARMAND, QUE., VIA CANADIAN PACIFIC RAILWAY TO  
STANBRIDGE AND CENTRAL VERMONT RAILWAY FROM  
STANBRIDGE TO BOUNDARY

*Elevations on page 318.*

- 63 Destroyed.
- 64 In top course of granite foundation, in south end of west wall of Canadian Bank of Commerce at Farnham.
- 65 In exposed rock surface, 15 feet west of Canadian Pacific railway track and 720 feet south of Mystic station.
- 66 In top course of granite foundation, in south end of west wall of Canadian Bank of Commerce at Bedford.
- 67 In top course of stone foundation, in west end of south wall of post-office and general store at Stanbridge station.
- 68 In second course of brickwork below water-table, in east end of north wall of Central Vermont station-house at St. Armand.
- 69 In second course below top, in west face of north abutment of old stone culvert under Central Vermont railway,  $\frac{1}{2}$  mile south of St. Armand.
- 70 In small granite boulder, 20 feet west of Central Vermont railway track, 190 feet south of international boundary post and  $1\frac{1}{4}$  miles south of St. Armand.

BENCH-MARKS BETWEEN FOSTER AND INTERNATIONAL BOUNDARY  
NEAR ABERCORN, QUE., VIA CANADIAN PACIFIC RAILWAY.

*Elevations on page 318*

- 48 In east side of rock cut on Canadian Pacific railway,  $1\frac{1}{4}$  miles north of Knowlton and 20 feet north of fourth telegraph pole north of mile-post 8 from Enlaugra.
- 49 In fourth course of stonework below water-table, in northeast end of northwest wall of Knowlton Academy, about 500 feet south of Canadian Pacific station.
- 50 In west face of second foundation pier from north end of oil tank, directly opposite Canadian Pacific station at Brome.
- 51 In square boulder, 15 feet west of Canadian Pacific railway track at Enlaugra and 70 feet south of south end of station platform.
- 52 In first course of stonework below brickwork, in west end of north wall of Mountain View hotel at Sutton.
- 53 In cap-stone on west end of old granite culvert under Canadian Pacific railway,  $1\frac{1}{4}$  miles north of Abercorn and at mileage 23.4 from Brookport.
- 54 In west face of concrete culvert under Canadian Pacific railway, 960 feet north of Abercorn station and at mileage 24.7 from Brookport.
- 55 In east face of concrete culvert under Canadian Pacific railway, 250 feet north of a diagonal highway crossing, 1 mile south of Abercorn and at mileage 25.8 from Enlaugra.

BENCH-MARKS BETWEEN SHERBROOKE, QUE., AND INTERNATIONAL  
BOUNDARY NEAR NORTON MILLS, VERMONT, VIA GRAND TRUNK RAILWAY.

*Elevations on page 319.*

- 1 In first course of stonework below water-table course, in south face of pilaster at southwest corner of Sherbrooke post-office.
- 2 In water-table course of stonework, in north wall of Canadian Bank of Commerce at Sherbrooke—21 feet from northeast corner of building.
- 3 In second course of stonework below top, in west end of south face of retaining wall behind north abutment of Grand Trunk railway bridge over Magog river at Sherbrooke, 2,000 feet north of the station.
- 4 In east side of rock cut on Grand Trunk railway,  $1\frac{1}{2}$  miles south of Sherbrooke station. This is the second rock cut south of Sherbrooke.
- 5 In second course below top, in south end of east face of stone culvert under Canadian Pacific railway, at mileage on 2 from Megantic— $\frac{1}{4}$  mile north of diamond crossing of Grand Trunk and Canadian Pacific railways between Sherbrooke and Lennoxville.
- 6 In top course of stonework, in west end of north face of retaining wall behind north abutment of Grand Trunk railway bridge over Massawippi river,  $\frac{1}{2}$  mile south of Lennoxville.
- 7 In top course of stonework, in west end of north face of retaining wall behind north abutment of Grand Trunk railway bridge over Salmon river,  $1\frac{1}{2}$  miles south of Lennoxville.
- 8 In large stone—58 feet from south end—of dry stone retaining wall lying along east side of Grand Trunk railway track,  $1\frac{1}{2}$  miles north of Waterville; this is the farther north of the two retaining walls near this point.
- 9 In north face of cap-stone on northwest retaining wall of Grand Trunk railway bridge over Coaticook river,  $\frac{1}{4}$  mile north of Waterville.
- 10 In west side of rock cut on Grand Trunk railway, 200 feet south of a farm crossing,  $\frac{1}{2}$  mile north of Compton and 1,925 feet north of mile-post 114 from Montreal.
- 11 In west side of rock cut on Grand Trunk railway—2 feet from south end of cut—420 feet north of a subway,  $1\frac{1}{2}$  miles south of Compton and 2,040 feet north of mile-post 116 from Montreal.
- 12 Destroyed
- 13 In top course of stonework, in rear (or northwest) face of retaining wall behind north abutment of subway under Grand Trunk railway,  $\frac{1}{2}$  mile south of Hillhurst.
- 14 In north face of northwest cap-stone of subway under Grand Trunk railway at Coaticook.
- 15 In first course of stonework below water-table course, in centre of west wall of Canadian Bank of Commerce at Coaticook.
- 16 In first course of stonework below water-table course, in west wall of Coaticook post-office, 8 feet south of main entrance.
- 17 In west side of rock cut on Grand Trunk railway—near south end of cut—1 mile south of Coaticook. This is the first rock cut south of Coaticook.
- 18 In east side of rock cut on Grand Trunk railway,  $2\frac{1}{2}$  miles south of Coaticook and 278 feet north of mile-post 125 from Montreal.

- 19 In centre of east side of rock cut on Grand Trunk railway,  $1\frac{1}{2}$  miles north of Dixville and 870 feet south of mile-post 126 from Montreal.
- 20 Destroyed.
- 21 In west side of rock cut on Grand Trunk railway—50 feet from north end of cut—on a sharp curve,  $1\frac{1}{2}$  miles south of Dixville and 225 feet north of mile-post 129 from Montreal.
- 22 In west side of rock cut on Grand Trunk railway—20 feet from south end of cut—on a sharp curve,  $1\frac{1}{2}$  miles south of Dixville and 2,140 feet south of mile-post 129 from Montreal.
- 23 In second course of stonework below top, in southeast face of southeast curved retaining wall of Grand Trunk railway bridge at international boundary, 400 feet north of Norton Mills station.
- 24 In second course of stonework above ground, in east end of south face of north abutment of Grand Trunk railway bridge at international boundary, 400 feet north of Norton Mills station.
- 25 In first course of stonework above ground, in east end of north face of south abutment of Grand Trunk railway bridge at international boundary, 400 feet north of Norton Mills station.

BENCH-MARKS BETWEEN ROUSE POINT, N.Y., AND COLBORNE, ONT.,  
VIA GRAND TRUNK RAILWAY TO ST. POLYCARPE JUNCTION,  
CANADIAN PACIFIC RAILWAY TO PRESCOTT AND GRAND  
TRUNK RAILWAY TO COLBORNE.

*Elevations on page 285.*

United States Coast and Geodetic Survey bench-mark in Chapman Block, Rouse Point.

- 81 In north stone abutment of plate-girder bridge on Grand Trunk railway,  $2\frac{1}{2}$  miles south of Lacolle Junction.
- 82 Destroyed.
- 83 In second course of stonework below cap-stone, in north face of east abutment of small culvert under Grand Trunk railway,  $1\frac{1}{2}$  miles west of Henrysburg and 1,560 feet west of mile-post 16 from Alburgh Junction.
- 84 Destroyed.
- 85 In south side of small rock cut on Grand Trunk railway, 120 feet east of a farm crossing and  $\frac{1}{4}$  mile east of Howick Junction.
- 86 In third course below cap-stone, in south face of west abutment of small dry stone culvert under Grand Trunk railway,  $1\frac{1}{2}$  miles west of Aubrey and at twelfth telegraph pole east of mile-post 33 from Alburgh Junction.
- 87 In third course of stonework below top, in southwest face of southwest retaining wall of circular stone culvert under Grand Trunk railway,  $\frac{1}{2}$  mile east of Howick Junction and at third telegraph pole west of a highway crossing.
- 88 In top course of stonework in southeast face of northeast retaining wall of circular cattle-pass under Grand Trunk railway, 720 feet east of St. Ives station.
- 89 In first course above platform, in west face of corner stone at southwest corner of Grand Trunk station-house at Vandalia.
- 90 In north face of southeasterly stone footing under Grand Trunk water-tank at Coteau Junction.

- 91 In southwest face—1 foot below top—of south concrete retaining wall of open culvert under Grand Trunk railway,  $1\frac{1}{2}$  miles southeast of St. Polycarpe.
- 92 In fourth course of stonework below top, in southwest face of northwest abutment of open culvert under Grand Trunk railway, 1,600 feet southeast of St. Polycarpe Junction.
- 93 In west face of stone coping on southwest retaining wall of Canadian Pacific railway bridge over Delisle river, 1 mile west of St. Polycarpe Junction.
- 94 In top of south end of 36-inch concrete tile culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile west of St. Téléphone flag-station.
- 95 In masonry base of Canadian Pacific water-tank at Dalhousie Mills, 7 feet to the left of the doorway underneath tank and 7 inches above door sill.
- 96 In south face of concrete arch culvert under Canadian Pacific railway,  $2\frac{1}{2}$  miles west of Dalhousie Mills and at mileage 44.5 from Montreal West.
- 97 In south face of boulder—6 feet by 6 feet—15 feet south of north line of Canadian Pacific railway right-of-way and 1 mile east of Green Valley.
- 98 In north face of boulder—4 feet by 4 feet—9 feet north of south line of Canadian Pacific railway right-of-way, 220 feet east of concrete tile culvert and  $\frac{1}{2}$  mile east of Glenroy flag-station.
- 99 In east face of boulder, 15 feet north of south line of Canadian Pacific railway right-of-way, 3 miles west of Glenroy flag-station and 460 feet west of mile-post 55 from Montreal West.
- 100 In west face of stone coping on northwest retaining wall of plate-girder bridge on Canadian Pacific railway  $\frac{1}{2}$  mile east of Apple Hill.
- 101 In north face of boulder, 10 feet north of south line of Canadian Pacific railway right-of-way, 1,000 feet east of a subway, 2 miles west of Apple Hill and 650 feet east of mile-post 60 from Montreal West.
- 102 In masonry base of Canadian Pacific water-tank at Monckland, 18 inches to the left of the doorway underneath tank and 20 inches above door sill.
- 103 In first course of stonework below brickwork, in east end of north wall of Avonmore Presbyterian church.
- 104 In south face of square concrete culvert under Canadian Pacific railway,  $1\frac{1}{2}$  miles west of Avonmore.
- 105 In south face of stone coping on retaining wall behind west abutment of plate-girder bridge over Payne river  $\frac{1}{2}$  mile east of Finch.
- 106 In south face of square concrete culvert under Canadian Pacific railway, 3 miles west of Finch and  $\frac{1}{2}$  mile east of east end of a long curve.
- 107 In masonry base of Canadian Pacific water-tank at Chesterville, 15 feet to the left of the doorway underneath tank and 4 feet above ground.
- 108 In south face of concrete retaining wall behind west abutment of subway under Canadian Pacific railway,  $2\frac{1}{2}$  miles east of Winchester.
- 109 In south face of boulder on Canadian Pacific railway right-of-way—close to north fence—50 feet west of road from Winchester station to village.
- 110 In south face of square concrete culvert under Canadian Pacific railway,  $\frac{1}{2}$  mile west of Lakeview.
- 111 In east stone foundation wall—5 feet 3 inches from southeast corner—of frame schoolhouse at Mountain station.

- 112 In south face of small square concrete culvert under Canadian Pacific railway, 2 miles east of Kempton.
- 113 In masonry base of Canadian Pacific water-tank at Kempton, 2 feet 5 inches to the right of the doorway underneath tank and 3 feet 8 inches above doorsill.
- 114 In east face of square concrete culvert under Canadian Pacific railway, 1 mile north of Oxford.
- 115 In north face of boulder—6 feet by 6 feet—on east side of Canadian Pacific railway track, 3 miles south of Oxford and 750 feet south of mile-post 38 from Ottawa.
- 116 In south wall of stone schoolhouse, 200 feet east of Canadian Pacific railway track and  $1\frac{1}{4}$  miles north of Spencerville. The bench-mark is 30 inches below water-table and 10 inches from southwest corner of building.
- 117 In east face of square concrete culvert under Canadian Pacific railway,  $2\frac{1}{4}$  miles south of Spencerville.
- 118 In north face of east stone abutment of bridge by which Grand Trunk railway main line passes over Canadian Pacific railway,  $1\frac{1}{4}$  miles east of Prescott. The bench-mark is a few inches above Canadian Pacific rails.
- 119 In third course of stonework above water-table, in east end of front (or north) wall of Grand Trunk station-house at Prescott.
- 120 In east face of cap-stone on south end of stone arch culvert under Grand Trunk Railway,  $3\frac{1}{2}$  miles west of Prescott.
- 121 In south face of southeast cap-stone of plate-girder bridge on Grand Trunk railway, 1 mile east of Maitland.
- 122 In south face of southwest cap-stone of plate-girder bridge on Grand Trunk railway,  $1\frac{1}{4}$  miles west of Maitland.
- 123 In south face of cap-stone on south end of small stone culvert under Grand Trunk railway, 100 feet east of Ormond street, Brockville, and 190 feet west of mile-post 200 from Toronto.
- 124 In centre of north face of south stone abutment of bridge by which Canadian Northern railway (Brookville-Westport line) passes over Grand Trunk railway,  $1\frac{1}{4}$  miles west of Brockville. The bench-mark is 1 foot above Grand Trunk rails.
- 125 In east end of south face of stone coping on southeast retaining wall of plate-girder bridge on Grand Trunk railway, 1000 feet west of Lyn.
- 126 In top course of stonework, in south face of east abutment of cattle-pass under Grand Trunk railway,  $2\frac{1}{4}$  miles west of Lyn.
- 127 In top course of stonework, in south face of west abutment of cattle-pass under Grand Trunk railway, 2 miles east of Maitland.
- 128 In south face of cap-stone on south end of square stone culvert under Grand Trunk railway, 1 mile west of Maitland and 100 feet east of a highway crossing.
- 129 In west end of south face of coping on south end of square stone culvert under Grand Trunk railway,  $3\frac{1}{4}$  miles west of Maitland and 1,000 feet east of mile-post 192 from Toronto.
- 130 In top course of stonework, in north face of east abutment of open culvert under Grand Trunk railway,  $\frac{1}{2}$  mile east of Lansdowne.
- 131 In first course of stonework above water-table, in west end of south wall of Lansdowne town-hall.
- 132 In top course of stonework, in north face of east abutment of open culvert under Grand Trunk railway beside a highway crossing— $4\frac{1}{4}$  miles east of Gananoque Junction.

- 133 In top course of stonework, in north face of east abutment of open culvert under Grand Trunk railway, 2 miles east of Gananoque Junction.
- 134 In east end of north face of stone coping on northeast retaining wall of Grand Trunk railway bridge over Gananoque river,  $1\frac{1}{2}$  miles west of Gananoque Junction.
- 135 In south face of southwest cap-stone of plate-girder bridge on Grand Trunk railway,  $1\frac{1}{2}$  miles east of Findley.
- 136 In north face of northeast cap-stone of plate-girder bridge on Grand Trunk railway, 2 miles west of Findley.
- 137 In east end of north face of cap-stone on north end of square stone culvert under Grand Trunk railway, 5 miles west of Findley and 1,200 feet west of a highway crossing.
- 138 In east face of stone coping on northeast retaining wall of Grand Trunk railway bridge over Rideau canal at Kingston Mills,  $\frac{1}{2}$  mile west of Rideau station.
- 139 In first course of stonework above water-table, in east end of front (or north) wall of Grand Trunk station-house at Kingston Junction.
- 140 In south face of southwest cap-stone of Grand Trunk railway bridge over Little Cataraqui creek,  $2\frac{1}{2}$  miles west of Kingston Junction, 870 feet east of mile-post 158 from Toronto and  $\frac{1}{2}$  mile east of crossing of main road from Kingston to Cataraqui.
- 141 In second course of stonework above concrete sidewalk, in south face of pilaster on south wall of Kingston city-hall. The pilaster referred to is immediately east of rounded southwest corner of building.
- 141-A In second course above concrete sidewalk, in north face of large corner stone at northeast corner of Kingston post-office—at southeast corner of Clarence and Wellington streets. The bench-mark is 28 feet east of centre line of the three arches forming main entrance to building.
- 142 In first course of stonework below water-table course, in west end of south wall of Canadian Pacific station-house at Kingston.
- 143 In south face of southwest cap-stone of open culvert under Grand Trunk railway,  $1\frac{1}{2}$  miles east of Collins Bay and 1,220 feet east of mile-post 155 from Toronto.
- 144 In west face of cap-stone on southwest retaining wall of plate-girder bridge on Grand Trunk railway, 0.4 mile west of Collins Bay.
- 145 In west end of south face of coping on south end of stone arch culvert under Grand Trunk railway,  $3\frac{1}{2}$  miles west of Collins Bay and 1,100 feet east of a highway crossing which is at mile-post 150 from Toronto.
- 146 In first course of stonework above water-table, in front (or south) wall of Grand Trunk station-house at Ernestown—3 feet west of waiting-room door.
- 147 In first course of stonework below southwest cap-stone, in east face of west abutment of small square culvert under Grand Trunk railway, 4 miles west of Ernestown and 470 feet west of mile-post 142 from Toronto.
- 148 In west face of coping on south end of stone arch subway under Grand Trunk railway, 3 miles east of Napanee.
- 149 In first course of stonework below water-table course, in east wall of Napanee court-house, 1 foot 6 inches south of first window from northeast corner of building.
- 150 In front (or north) wall of Grand Trunk station-house at Napanee, 1 foot east of westerly doorway.
- 150-A In first course of stonework above ground, in west wall of Napanee post-office, 8 feet 6 inches south of centre line of main entrance.
- 150-A-2 In fifth course of stonework below water-table course, in east face of pilaster at southeast corner of Armoury at Napanee.

- 151 In east face of south-west exposure of plate-girder bridge on Grand Trunk railway,  $3\frac{1}{2}$  miles west of Napanee. This bridge is the farther east of the two bridges near this point.
- 152 In west face of coping on north end of stone arch culvert under Grand Trunk railway,  $\frac{1}{2}$  mile east of Marysville.
- 153 In east face of stone coping on northeast retaining wall of Grand Trunk railway bridge over Salmon river,  $1\frac{1}{2}$  miles east of Shannonville.
- 154 In first course of stone work above water-table, in north face of corner stone at northwest corner of Grand Trunk station-house at Shannonville.
- 155 In north face of northeast exposure of plate-girder bridge on Grand Trunk railway,  $4\frac{1}{2}$  miles east of Belleville and 1000 feet west of a highway crossing.
- 156 In first course of stonework above water-table, in front or north wall of Grand Trunk station-house at Belleville, approximately west of easterly doorway.
- 157 In east face of retaining wall of Belleville city hall, 16 inches below water-table course of stonework and 4 feet 6 inches south of first basement window from northeast corner of building.
- 157 A In third course of stonework below brickwork, in west end of north wall of Arsenal at Belleville.
- 157 A 2 In eighth face of wall below east coping, on concrete pier of Canadian Pacific railway bridge over the river at Belleville. This pier extends to a main trestle east of small subway leading to park.
- 158 In east face of north-west exposure of plate-girder bridge on Grand Trunk railway, 5 miles west of Belleville and 1400 feet from Trenton.
- 159 In south face of south-west exposure of open culvert under Grand Trunk railway,  $5\frac{1}{2}$  miles west of Belleville.
- 160 In north face of north-west exposure of open culvert under Grand Trunk railway,  $5\frac{1}{4}$  miles east of Trenton and 1050 feet from Trenton.
- 161 In east face of stone arch at northeast corner of east abutment of bridge by which Grand Trunk railway crosses over the Northern railway (Trenton-Marysville line) at Trenton station.
- 162 In south face of north-west exposure of open culvert under Grand Trunk railway, 1 mile east of Smithfield station.
- 163 In east face of north-west exposure of open culvert under Grand Trunk railway,  $\frac{1}{2}$  mile east of Brighton.
- 164 In north face of north-west exposure of open culvert under Grand Trunk railway,  $1\frac{1}{2}$  miles west of Brighton and 1000 feet from Brighton.
- 165 In east face of north-west exposure of stone arch at north end of open culvert under Grand Trunk railway,  $\frac{1}{2}$  mile west of Brighton.
- 166 In east face of north-west exposure of stone arch at north end of open culvert under Grand Trunk railway, 1 mile west of Cambridge.

TABLE II.

## RESULTS OF PRECISE LEVELLING.

ST. ANSELME, QUE., TO EDMUNDSTON, N.B.

*Run by T. C. Dennis and J. E. Ratz.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 214-B.	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial	Total		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
	214 B					553.825	214 B
211 B	224 B	2.4	2.4	+ .026	+ .026	604.845	224 B
224 B	224 B	3.2	5.6	+ .025	+ .051	671.009	224 B
224 B	225 B	2.4	8.0	- .011	- .040	740.349	225 B
225 B	227 B	5.1	13.1	- .013	- .027	765.904	227 B
227 B	228 B	2.6	15.7	+ .019	+ .045	810.759	228 B
228 B	229 B	3.4	19.1	- .026	- .020	809.029	229 B
229 B	230 B	2.7	21.8	+ .007	+ .027	900.590	230 B
230 B	231 B	2.5	24.3	+ .010	+ .037	948.882	231 B
231 B	232 B	2.8	27.1	+ .003	+ .040	970.240	232 B
232 B	233 B	2.8	29.9	0.000	+ .040	989.834	233 B
233 B	234 B	3.1	33.0	+ .015	+ .055	984.248	234 B
234 B	235 B	3.1	36.1	+ .020	+ .075	1007.299	235 B
235 B	236 B	3.4	39.5	+ .009	+ .084	1061.743	236 B
236 B	237 B	2.9	42.4	0.001	+ .080	1116.177	237 B
237 B	238 B	3.2	45.6	0.005	+ .075	1170.944	238 B
238 B	239 B	3.1	48.7	0.020	+ .055	1230.211	239 B
239 B	240 B	3.2	51.9	+ .013	+ .068	1280.157	240 B
240 B	241 B	2.3	54.2	0.008	+ .060	1300.981	241 B
241 B	242 B	2.5	56.7	- .021	+ .039	1281.969	242 B
242 B	243 B	2.3	59.0	0.002	+ .037	1225.149	243 B
243 B	244 B	2.1	61.1	+ .010	+ .047	1266.833	244 B
244 B	245 B	2.7	63.8	+ .014	+ .061	1222.549	245 B
245 B	246 B	3.0	66.8	+ .006	+ .067	1230.500	246 B
246 B	247 B	2.8	69.6	+ .012	+ .079	1292.751	247 B
247 B	248 B	3.3	72.9	+ .026	+ .105	1273.525	248 B
248 B	249 B	3.2	76.1	+ .002	+ .107	1336.487	249 B
249 B	385 B	3.2	79.3	0.029	+ .078	1760.049	385 B
385 B	384 B	2.5	81.8	0.011	+ .067	1664.415	384 B
384 B	383 B	5.1	86.9	- .019	+ .048	1420.830	383 B
383 B	382 B	2.4	89.3	+ .029	+ .028	1422.473	382 B
382 B	381 B	4.6	93.9	- .014	+ .017	1435.343	381 B
381 B	380 B	1.0	94.9	+ .003	+ .020	1290.742	380 B
380 B	379 B	1.6	97.5	- .019	+ .001	1443.845	379 B
379 B	378 B	4.2	101.7	0.028	- .027	1082.054	378 B
378 B	377 B*	1.3	106.0	0.010	- .037	1094.480	377 B*
377 B*	376 B	4.9	110.9	+ .020	+ .017	1903.001	376 B

\*See also elevation of this bench-mark on page 202.



## RESULTS OF PRECISE LEVELLING.

ST. ANSELME, QUE., TO EDMUNDSTON, N.B.—*Concluded.**Run by T. C. Dennis and J. E. Ratz.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 214-B.	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
376 B	375 B	6.5	117.4	+ .034	+ .017	1079.260	375-B
375 B	288 B	4.4	121.8	+ .033	+ .050	1142.737	288 B
288 B	287 B	0.6	122.4	- .001	+ .049	1144.473	287 B
287 B	286 B	4.5	126.9	+ .020	+ .069	1209.691	286 B
286 B	285 B	1.7	128.6	+ .017	+ .086	1197.271	285 B
285 B	284 B	0.8	129.4	- .017	+ .069	1177.829	284 B
284 B	283 B	4.2	133.6	- .016	+ .053	1231.385	283 B
283 B	282 B	1.7	135.3	- .010	+ .043	1259.350	282 B
282 B	281 B	4.0	139.3	- .025	+ .018	1173.841	281-B
281 B	280 B	1.9	141.2	- .007	+ .011	1078.238	280 B
280 B	279 B	0.9	142.1	- .004	+ .007	1020.236	279-B
279 B	278 B	2.8	144.9	+ .007	+ .014	874.645	278-B
278 B	276 B	3.1	148.0	+ .016	+ .030	709.119	276-B
276 B	277 B		148.0	- .002	+ .028	685.581	277 B
276 B	275 B	3.3	151.3	+ .017	+ .047	706.083	275 B
275 B	274 B	5.9	157.2	.000	+ .047	644.351	274 B
274 B	273 B	3.0	161.1	+ .016	+ .063	675.274	273-B
273 B	272 B	3.6	164.7	+ .030	+ .003	662.967	272 B
272 B	271 B	4.7	169.4	- .001	+ .092	669.176	271 B
271 B	270 B	4.7	174.1	+ .023	+ .115	704.845	270 B
270 B	269 B	3.7	177.8	+ .011	+ .126	680.706	269 B
269 B	268 B	2.2	180.0	.000	+ .126	676.659	268 B
268 B	267 B	2.0	182.9	- .004	+ .122	696.228	267-B
267 B	266 B	2.0	184.9	+ .022	+ .144	651.596	266-B
266 B	265 B	3.6	188.5	.020	+ .124	579.532	265-B
265 B	264 B	2.8	191.3	+ .018	+ .142	514.493	264-B
264 B	263 B	1.5	192.8	+ .001	+ .143	493.481	263 B
263 B	262 B	3.0	195.8	- .009	+ .134	497.273	262 B
262 B	261 B	2.5	198.3	+ .013	+ .147	488.485	261-B
261 B	260 B	3.2	201.5	- .006	+ .141	470.438	260 B
260 B	58 B*	3.1	204.6	+ .001	+ .142	473.540	58-B*

\*See also elevation of this bench-mark on page 314.

RESULTS OF PRECISE LEVELLING  
HARLAKA JUNCTION TO RIVIERE-DU-LOUP, QUE.

Run by G. F. Dalton.

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 219-B	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
219-B	219-B					177.096	219-B
MCXXXV	MCXXXV	1.0	1.0	+ .007	+ .007	239.622	MCXXXV
MCXXXIV	MCXXXIV	2.1	3.1	- .010	- .003	299.144	MCXXXIV
MCXXXIII	MCXXXIII	2.7	5.8	- .002	- .005	306.637	MCXXXIII
MCXXXII	MCXXXII	2.5	8.3	+ .011	+ .006	322.696	MCXXXII
MCXXXI	MCXXXI	2.1	10.4	- .007	- .001	283.202	MCXXXI
MCXXX	MCXXX	2.1	12.5	- .001	- .002	205.189	MCXXX
MCXXIX	MCXXIX	1.1	13.6	- .010	- .012	167.476	MCXXIX
MCXXVIII	MCXXVIII	1.7	15.3	+ .004	- .008	178.004	MCXXVIII
563-B	563-B	1.0	16.3	+ .003	- .005	169.441	563-B
563-B	MCXXVI	1.0	17.3	+ .011	+ .006	194.310	MCXXVI
MCXXV	MCXXV	2.1	19.4	+ .004	+ .010	146.516	MCXXV
MCXXIV	MCXXIV	1.2	20.6	+ .018	+ .028	151.125	MCXXIV
MCX	MCX	3.6	24.2	- .011	+ .017	128.817	MCX
MCXI	MCXI	1.7	25.9	+ .004	+ .021	127.714	MCXI
564-B	564-B	0.9	26.8	- .001	+ .020	135.892	564-B
565-B	565-B	2.0	28.8	+ .012	+ .032	123.193	565-B
MCXIII	MCXIII	2.4	31.2	- .013	+ .019	90.969	MCXIII
566-B	566-B	2.2	33.4	- .016	+ .003	53.498	566-B
MCXV	MCXV	1.2	34.6	+ .008	+ .011	53.781	MCXV
MCXVI	MCXVI	0.5	35.1	+ .003	+ .014	54.231	MCXVI
MCXVII	MCXVII	1.0	36.1	+ .004	+ .018	72.703	MCXVII
MCXVIII	MCXVIII	2.0	38.1	- .003	+ .015	105.921	MCXVIII
567-B	567-B	2.2	40.3	- .004	+ .011	122.619	567-B
MCXIX	MCXIX	3.5	43.8	+ .023	+ .034	107.889	MCXIX
MCXX	MCXX	1.5	45.3	+ .017	+ .051	104.350	MCXX
568-B	568-B	0.8	46.1	+ .001	+ .052	104.842	568-B
MCXXI	MCXXI	0.3	46.4	+ .001	+ .053	91.620	MCXXI
569-B	569-B	0.8	47.2	- .001	+ .052	77.130	569-B
MCXXII	MCXXII	0.3	47.5	.003	+ .049	74.749	MCXXII
MCXXIII	MCXXIII	2.0	49.5	+ .010	+ .059	79.246	MCXXIII
MCIX	MCIX	0.9	50.4	- .013	+ .046	99.455	MCIX
MCVIII	MCVIII	1.6	52.0	- .022	+ .024	136.074	MCVIII
570-B	570-B	1.2	53.2	+ .004	+ .028	153.267	570-B
MCVI	MCVI	0.7	53.9	+ .008	+ .036	162.109	MCVI
571-B	571-B	3.6	57.5	+ .019	+ .055	165.734	571-B
MCV	MCV	1.9	59.4	+ .007	+ .062	146.827	MCV
MCIV	MCIV	1.5	60.9	.005	+ .067	129.746	MCIV
MCH	MCH	2.6	63.5	.000	+ .067	108.366	MCH
572-B	572-B	1.7	65.2	.006	+ .064	101.195	572-B
573-B	573-B	1.9	67.1	- .002	+ .059	93.964	573-B

## RESULTS OF PRECISE LEVELLING.

HARLAKA JUNCTION TO RIVIERE-DU-LOUP, QUE.—*Concluded.**Run by G. F. Dalton.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 219-B.	DISCREPANCY.		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles	Miles	Feet.	Feet.	Feet	No.
573-B	MXCIX	2.4	69.5	+ .006	+ .065	96.158	MXCIX
MXCIX	MXCVIII	1.9	71.4	- .017	+ .048	70.388	MXCVIII
MXCVIII	574-B	0.9	72.3	+ .002	+ .050	74.210	574-B
574-B	MXCVI	1.7	74.0	- .020	+ .030	53.766	MXCVI
MXCVI	MXCV	1.4	75.4	+ .008	+ .038	35.158	MXCV
MXCV	MCXXXVII	0.6	76.0	+ .005	+ .043	48.384	MCXXXVII
MCXXXVII	MCXXXVIII	1.1	77.1	- .010	+ .033	62.546	MCXXXVIII
MCXXXVIII	MCXXXIX	1.2	78.3	+ .011	+ .044	97.899	MCXXXIX
MCXXXIX	MCXLII	1.1	79.4	- .011	+ .033	135.937	MCXLII
MCXLII	27-G	0.4	79.8	+ .002	+ .035	145.018	27-G
27-G	28-G	2.5	82.3	+ .003	+ .038	564.311	28-G
28-G	29-G	3.0	85.3	+ .010	+ .048	740.743	29-G
29-G	30-G	2.5	87.8	+ .012	+ .060	1045.489	30-G
30-G	377-B*	5.4	93.2	+ .027	+ .087	1094.393	377-B*
MCXLII	575-B	1.8	81.2	- .005	+ .028	178.186	575-B
575-B	MCXLIII	1.5	82.7	- .004	+ .024	191.738	MCXLIII
MCXLIII	576-B	1.7	84.4	+ .003	+ .027	173.478	576-B
576-B	MCXLIV	1.0	85.4	- .007	+ .020	184.767	MCXLIV
MCXLIV	MCXLVI	0.5	85.9	+ .008	+ .028	183.841	MCXLVI
MCXLIV	MCXLV	1.3	86.7	- .018	+ .002	219.395	MCXLV
MCXLV	577-B	2.0	89.3	+ .001	+ .003	308.741	577-B
577-B	MCXLVIII	1.0	90.3	- .006	- .003	311.482	MCXLVIII
MCXLVIII	578-B	0.9	91.2	- .016	- .019	314.473	578-B
578-B	MCXLIX	3.1	94.3	+ .017	- .002	338.183	MCXLIX
MCXLIX	579-B	2.1	96.4	- .019	- .021	345.261	579-B
579-B	MCL	2.0	98.4	+ .016	- .005	370.612	MCL
MCL	MCLI	0.7	99.1	- .002	- .007	369.472	MCLI
MCLI	MCLII	2.0	101.1	- .006	- .013	414.476	MCLII
MCLII	MCLXVII	2.3	103.4	- .007	- .020	376.160	MCLXVII
MCLXVII	MCLXVI	1.4	104.8	+ .001	- .019	336.502	MCLXVI
MCLXVI	579-B-2	1.0	105.8	+ .005	- .014	350.611	579-B-2
579-B-2	MCLXV	1.2	107.0	+ .008	- .006	329.949	MCLXV
MCLXV	MCLXIV	1.5	108.5	- .009	- .015	321.892	MCLXIV
MCLXIV	580-B	0.2	108.7	- .004	- .019	329.674	580-B
580-B	MCLXIII	2.4	111.1	- .010	- .029	311.262	MCLXIII
MCLXIII	77-B†		111.1	+ .003	- .026	313.176	77-B†

†Branch from MCXLII to 377-B was run by H. P. Moulton

\*See also elevation of this bench-mark on page 289.

†See also elevation of this bench-mark on page 315.

## RESULTS OF PRECISE LEVELLING.

## OTTAWA TO RENFREW, ONT.

Run by H. P. Moulton.

BENCH-MARK.		Distance between successive bench-marks.	Distance from bench-mark 125-A.	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
125-A	125-A					277.639	125-A
50-G	50-G	3.0	3.0	-.004	-.004	201.410	50-G
51-G	51-G	2.7	5.7	-.016	-.020	186.753	51-G
52-G	52-G	1.7	7.4	+.001	-.019	197.504	52-G
53-G	53-G	2.2	9.6	+.021	+.002	272.271	53-G
54-G	54-G	2.7	12.3	+.021	+.023	367.718	54-G
55-G	55-G	3.1	15.4	+.014	-.037	366.885	55-G
56-G	56-G	3.5	18.9	+.010	+.047	433.497	56-G
57-G	57-G	2.9	21.8	-.004	+.043	445.745	57-G
58-G	58-G	2.4	24.2	-.002	+.041	450.023	58-G
59-G	59-G	3.1	27.3	+.020	+.061	427.484	59-G
60-G*	60-G*	2.4	29.7	+.004	+.065	449.509	60-G*
61-G	61-G	0.4	30.1	+.003	+.068	451.241	61-G
62-G	62-G	0.2	30.3	-.001	+.067	443.194	62-G
63-G	63-G	3.5	33.8	+.002	+.069	411.347	63-G
64-G	64-G	2.8	36.6	-.021	+.048	393.084	64-G
64-G	65-G		36.6	+.002	+.050	393.769	65-G
66-G	66-G	0.1	36.7	+.002	+.050	399.567	66-G
67-G	67-G	4.7	41.4	-.025	+.025	377.820	67-G
68-G	68-G	3.8	45.2	-.019	+.006	317.560	68-G
69-G	69-G	0.4	45.6	-.002	+.004	337.535	69-G
70-G	70-G	1.6	47.2	+.015	+.019	332.174	70-G
71-G	71-G	2.0	49.2	+.002	+.021	333.025	71-G
72-G	72-G	2.4	51.6	-.022	-.001	317.131	72-G
73-G	73-G	1.5	53.1	-.003	-.004	300.415	73-G
74-G	74-G	0.1	53.2	+.001	-.003	299.031	74-G
74-G	75-G	0.2	53.4	-.000	-.003	278.255	75-G
74-G	76-G	5.0	58.2	+.012	+.009	389.915	76-G

\*See also elevation of this bench-mark on page 297.

RESULTS OF PRECISE LEVELLING.  
OTTAWA TO RENFREW, ONT.—*Concluded*

*Run by H. P. Moulton.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 125-A	DISCREPANCY.		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
76-G	77-G	3.8	62.0	+ .031	+ .040	452.091	77-G
77-G	78-G	2.0	64.0	+ .003	+ .013	490.863	78-G
78-G	79-G	3.7	67.7	+ .024	+ .067	468.449	79-G
79-G	505*	1.9	69.6	— .004	+ .063	425.824	505*

\*The elevation of bench-mark 505 given on page 32, 1915 publication, is 425.628—see introduction (this publication) page 241. See also elevation on page 299.

Connections with Public Works Dept's bench-marks:—

B.M. — CCCCLXVI — C.P.R. Broad St. station, Ottawa, Elev. 184.059

B.M. — CCCCLXII — J. Whitten's house, Britannia, Elev. 202.728.

B.M. — CCCCLXXVII — C.P.R. station, Arnprior, Elev. 300.060.

B.M. — CCCCLXXXV — C.P.R. water-tank, Renfrew, Elev. 418.065

## RESULTS OF PRECISE LEVELLING.

## KEMPTON TO IVANHOE, ONT.

*Run by H. P. Moulton.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 113.	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
113	113					337.269	113
80-G	80-G	2.0	2.0	+ .016	+ .016	323.710	80-G
81-G	81-G	3.4	5.4	- .005	+ .011	321.933	81-G
82-G	82-G	2.2	7.6	+ .015	+ .026	350.790	82-G
83-G	83-G	2.4	10.0	+ .007	+ .033	363.035	83-G
84-G	84-G	1.1	11.1	- .005	+ .028	358.640	84-G
85-G	85-G	2.5	13.6	+ .005	+ .033	348.847	85-G
86-G	86-G	3.1	16.7	- .004	+ .029	355.646	86-G
87-G	87-G	2.6	19.3	- .022	+ .007	397.618	87-G
88-G	88-G	1.5	20.8	+ .010	+ .017	425.121	88-G
88-G	107-G	0.5	21.3	+ .005	+ .022	427.273	107-G
107-G	108-G	0.1	21.4	+ .001	+ .023	430.201	108-G
88-G	89-G	0.5	21.3	.000	+ .017	427.737	89-G
89-G	109-G	2.8	24.1	- .015	+ .002	413.572	109-G
109-G	110-G	1.8	25.9	- .004	- .002	423.687	110-G
110-G	111-G	2.6	28.5	- .009	- .011	437.342	111-G
111-G	112-G	3.6	32.1	- .005	- .016	434.536	112-G
112-G	113-G	0.2	32.3	+ .002	- .014	439.743	113-G
113-G	114-G	0.5	32.8	+ .004	- .010	440.201	114-G
114-G	115-G	.....	32.8	+ .001	- .009	440.729	115-G
113-G	116-G	2.4	34.7	- .018	- .032	458.781	116-G
116-G	117-G	1.6	36.3	+ .021	- .011	466.709	117-G
117-G	118-G	3.5	39.8	- .004	- .015	480.003	118-G
118-G	119-G	2.7	42.5	+ .011	- .004	518.327	119-G
119-G	120-G	2.9	45.4	+ .015	+ .011	617.126	120-G
120-G	121-G	2.6	48.0	.000	+ .011	576.661	121-G
121-G	122-G	2.5	50.5	- .012	- .001	584.383	122-G
122-G	123-G	3.4	53.9	- .011	- .012	690.278	123-G
123-G	124-G	4.1	58.0	- .014	- .026	649.083	124-G
124-G	161-G	2.5	60.5	+ .004	- .022	641.982	161-G
161-G	162-G	3.3	63.8	- .019	- .041	732.765	162-G
162-G	163-G	3.1	66.9	+ .007	- .034	682.448	163-G
163-G	164-G	2.7	69.6	.000	- .034	654.117	164-G
164-G	165-G	2.2	71.8	- .017	- .051	618.937	165-G
165-G	166-G	3.0	74.8	+ .007	- .044	663.797	166-G
166-G	167-G	3.0	77.8	+ .011	- .033	666.962	167-G
167-G	168-G	2.8	80.6	+ .008	- .025	690.759	168-G
168-G	169-G	4.5	85.1	+ .009	- .016	649.942	169-G

RESULTS OF PRECISE LEVELLING.  
KEMPTON TO IVANHOE, ONT.—*Concluded*

*Run by H. P. Moulton.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 113.	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles	Feet.	Feet.	Feet.	No.
169-G	170-G	2.3	87.4	+002	-014	585.077	170-G
170-G	171-G	3.6	91.0	+020	+006	564.168	171-G
171-G	172-G	3.0	94.0	+007	+013	478.677	172-G
172-G	173-G	2.5	96.5	-000	+013	466.853	173-G
173-G	174-G	2.2	98.7	+014	+027	470.576	174-G
174-G	175-G	0.2	98.9	-004	-023	481.256	175-G
175-G	176-G	.....	98.9	+001	+024	484.292	176-G
175-G	177-G	2.8	101.7	+018	+041	588.355	177-G
177-G	178-G	2.9	104.6	+021	+062	615.686	178-G
178-G	179-G	2.5	107.1	+005	+067	586.659	179-G

RESULTS OF PRECISE LEVELLING  
SMITHS FALLS TO CARLETON PLACE, ONT.

*Run by H. P. Macdonald*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 89-G	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
89-G	89-G					427.737	89-G
90-G	90-G	1.3	1.3	-.004	-.004	410.329	90-G
91-G	91-G	2.3	3.6	-.004	-.008	433.082	91-G
92-G	92-G	3.5	7.1	-.007	-.015	451.164	92-G
93-G	93-G	4.2	11.3	+.004	-.011	457.718	93-G
94-G	94-G	2.5	13.8	+.023	+.012	457.743	94-G
	60-G*	2.7	16.5	+.029	+.041	449.669	60-G*

\*See also elevation of this bench-mark on page 293



RESULTS OF PRECISE LEVELLING.  
SMITHS FALLS TO BROCKVILLE, ONT

Run by H. P. Moulton.

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 88-G.	DISCREPANCY		Elevation above mean sea level	BENCH-MARK
From	To			Partial.	Total.		
No.	No.	Miles	Miles	Feet.	Feet	Feet	No.
	88-G					425.121	88-G
88-G	95-G	1.5	1.5	.014	.014	379.462	95-G
95-G	96-G	3.3	4.8	.019	.033	346.176	96-G
96-G	97-G	2.3	7.1	-.009	-.024	342.737	97-G
97-G	98-G	2.5	9.6	-.005	-.019	363.710	98-G
98-G	99-G	3.5	13.1	.002	-.021	383.546	99-G
99-G	100-G	2.5	15.6	-.014	-.040	374.064	100-G
100-G	101-G	2.0	17.6	-.006	-.044	364.479	101-G
101-G	102-G	2.3	19.9	-.027	-.031	391.039	102-G
102-G	103-G	3.6	23.5	-.025	-.006	371.081	103-G
103-G	104-G	2.1	25.6	.004	-.010	342.052	104-G
104-G	123*	2.7	28	-.003	-.007	295.605	123*
123*	105-G	0.7	29.0	-.005	-.002	313.075	105-G
105-G	106-G	0.4	29.1	-.001	-.003	298.690	106-G

\*The elevation of bench-mark 123 given on page 321, this publication is 295.644; hence, to reduce all Brockville bench-marks to that datum, 0.029 foot should be added to the elevations given above for bench-marks 123, 105-G, 106-G.

RESULTS OF PRECISE LEVELLING.  
SHARBOT LAKE TO RENFREW, ONT.

Run by H. P. Moulton.

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 124-G.	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
	124-G					649.083	124-G
124-G	125-G	2.8	2.8	-000	-000	692.028	125-G
125-G	126-G	2.6	5.4	+001	+001	668.016	126-G
126-G	127-G	3.7	9.1	-027	-026	765.733	127-G
127-G	128-G	2.2	11.3	+007	-019	727.814	128-G
128-G	129-G	3.8	15.1	-012	-031	695.775	129-G
129-G	130-G	2.7	17.8	+006	-025	801.096	130-G
130-G	131-G	3.0	20.8	-004	-029	889.065	131-G
131-G	132-G	3.0	23.8	+015	-014	830.892	132-G
132-G	133-G	3.0	26.8	+018	+004	685.272	133-G
133-G	134-G	3.3	30.1	+017	+021	612.298	134-G
134-G	135-G	2.3	32.4	-003	+018	630.209	135-G
135-G	136-G	2.2	34.6	-006	+012	648.393	136-G
136-G	137-G	2.8	37.4	+005	+017	608.257	137-G
137-G	138-G	2.5	39.9	+002	+019	552.134	138-G
138-G	139-G	2.6	42.5	-017	+002	512.589	139-G
139-G	140-G	2.9	45.4	-011	-009	569.709	140-G
140-G	141-G	4.0	49.4	-013	-022	572.130	141-G
141-G	142-G	2.6	52.0	-013	-035	529.917	142-G
142-G	143-G	2.7	54.7	+007	-028	407.692	143-G
143-G	505*	2.3	57.0	+017	-011	426.025	505*

\*See also elevations of this bench-mark on page 294

RESULTS OF PRECISE LEVELLING  
SHARBOT LAKE TO KINGSTON, ONT.

*Rev. by H. P. Meadon*

BENCH-MARK		Distance between successive bench- marks	Distance from bench- mark 124 G	DISCREPANCY		Elevation above mean sea level	BENCH-MARK
From	To			Parted	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
	124 G					649.083	124 G
124 G	144 G	2.7	2.7	-.014	-.014	656.086	144 G
144 G	150 G	2.8	5.5	-.019	-.033	665.324	145 G
145 G	146 G	2.6	8.1	+.006	-.027	651.287	146 G
146 G	147 G	1.7	9.8	-.000	-.027	593.025	147 G
147 G	148 G	2.3	12.1	-.015	-.042	603.290	148 G
148 G	149 G	2.0	14.1	-.002	-.044	561.739	149 G
149 G	150 G	1.0	15.1	+.002	-.042	500.977	150 G
150 G	151 G	2.9	20.0	+.012	-.030	469.018	151 G
151 G	152 G	2.5	22.5	-.002	-.032	452.715	152 G
152 G	153 G	3.1	25.6	-.003	-.035	518.949	153 G
153 G	154 G	2.5	28.1	+.014	-.021	483.895	154 G
154 G	155 G	2.4	30.5	-.019	-.040	441.662	155 G
155 G	156 G	2.4	32.9	-.020	-.060	464.888	156 G
156 G	157 G	1.0	33.9	+.012	-.048	454.625	157 G
157 G	158 G	2.0	35.9	-.016	-.064	398.001	158 G
158 G	159 G	1.5	37.4	-.011	-.075	317.368	159 G
159 G	160 G	3.0	42.4	-.004	-.079	265.285	160 G
160 G	139*	2.7	45.1	+.020	-.059	276.740	139*

\*See also elevation of this bench mark on page 321

## RESULTS OF PRECISE LEVELLING.

## IVANHOE TO BELLEVILLE, ONT.

*Run by W. N. McGrath.*

BENCH-MARK		Distance between successive bench- marks.	Distance from bench- mark 179-G	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial	Total		
No.	No.	Miles.	Miles	Feet	Feet	Feet	No.
	179-G					586.659	179-G
179-G	180-G	4.7	4.7	- 026	- 026	457.339	180-G
180-G	181-G	1.9	6.6	- 009	- 035	447.381	181-G
181-G	182-G	1.8	8.4	+ 014	- 021	509.318	182-G
182-G	183-G	4.1	12.5	+ 025	+ 004	363.930	183-G
183-G	184-G	2.0	14.5	+ 016	+ 020	356.684	184-G
184-G	185-G	3.6	18.1	+ 021	+ 041	329.160	185-G
185-G	186-G	1.1	19.2	+ 001	+ 042	324.461	186-G
186-G	156*	1.6	20.8	- 001	+ 041	288.337	156*

\*See also elevation of this bench-mark on page 322.

## RESULTS OF PRECISE LEVELLING.

## STEELTON TO FRANZ, ONT.

*Ran by A. J. Greenboth.*

BENCH-MARK.		Distance between successive bench- marks	Distance from bench- mark 634	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
634	634					607.622	634
637	637	3.0	3.0	+017	+017	607.577	637
638	638	3.8	6.8	+018	+001	8.363	638
639	639	3.1	9.9	+021	+020	102.359	639
640	640	3.1	13.0	+016	+004	1074.048	640
641	641	3.0	16.0	+014	+010	1100.973	641
642	642	3.3	19.3	+015	+025	1142.893	642
643	643	2.8	22.1	+004	+021	1091.677	643
644	644	3.0	25.1	+012	+033	1011.648	644
645	645	2.9	28.0	+000	+033	845.407	645
646	646	2.5	30.5	+006	+027	776.692	646
647	647	2.5	33.0	+003	+30	904.036	647
648	648	3.4	36.4	+008	+038	995.795	648
649	649	2.3	38.7	+002	+036	1080.422	649
650	650	3.1	41.8	+017	+053	1103.066	650
651	651	3.5	45.3	+008	+061	1153.723	651
652	652	2.9	48.2	+001	+060	1207.961	652
653	653		51.3	+007	+067	1026.701	653
654	654		54.6	+038	+105	1106.150	654
655	655	2.8	57.4	+017	+122	1129.000	655
656	656	3.1	60.5	+019	+103	1284.159	656
657	657	2.9	63.4	+037	+140	1434.139	657
658	658	3.0	66.4	+021	+161	1369.153	658
659	659	3.1	69.5	+024	+185	1266.084	659
660	660	2.8	72.3	+007	+192	1426.144	660
661	661	3.9	76.2	+034	+205	1249.245	661
662	662	3.3	78.5	+024	+229	1070.833	662
663	663	1.5	80.0	+009	+229	1031.592	663
664	664	1.4	81.4	+004	+224	1446.968	664
665	665	3.0	84.4	+015	+239	1369.639	665
666	666	2.7	87.1	+015	+224	1444.305	666
667	667	3.6	91.7	+027	+251	1277.914	667
668	668	3.1	95.0	+028	+223	1514.793	668
669	669	3.0	98.0	+021	+292	1477.079	669
670	670	3.1	101.1	+003	+296	1457.502	670
671	671	2.9	104.0	+001	+297	1418.494	671
672	672	3.0	107.0	+000	+297	1334.807	672
673	673	2.8	110.8	+067	+244	984.321	673
674	674	2.9	113.7	+014	+250	968.798	674
675	675	3.3	116.0	+010	+240	1025.757	675
676	676	3.0	119.0	+019	+259	1034.951	676

RESULTS OF PRECISE LEVELLING.  
STEELTON TO FRANZ, ONT.—*Concluded*

*Run by A. J. Ravinbath*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 631	DISCREPANCY		Elevation above mean sea level	BENCH-MARK
From	To			Partial	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
676	677	1.9	120.9	+ 007	+ 266	1047.723	677
677	678	3.1	124.0	- 002	+ 264	1058.819	678
678	679	3.8	127.8	- 031	+ 233	1081.673	679
679	680	3.5	131.3	+ 010	+ 243	1110.034	680
680	681	2.7	134.0	+ 004	+ 247	1234.044	681
681	682	3.2	137.2	+ 001	+ 248	1236.272	682
682	683	3.0	140.2	- 022	+ 226	1266.619	683
683	684	2.8	143.0	- 017	+ 209	1381.477	684
684	685	2.9	145.9	- 003	+ 206	1075.012	685
685	686	5.7	151.6	- 005	+ 201	923.567	686
686	687	3.1	154.7	+ 031	+ 242	1031.080	687
687	688	3.3	158.0	+ 033	+ 265	1080.570	688
688	689	4.1	162.1	+ 009	+ 274	1080.833	689
689	*690	2.6	164.7	+ 003	+ 277	1078.301	690
690	691	2.8	167.5	- 014	+ 263	1191.273	691
691	692	1.2	170.7	- 027	+ 236	1141.068	692
692	693	2.8	173.5	+ 019	+ 255	1070.233	693
693	694	1.0	177.5	+ 013	+ 268	1077.015	694
694	695	2.0	179.5	- 017	+ 251	1122.188	695
695	696	3.1	182.6	- 012	+ 239	961.024	696
696	697	4.6	187.2	+ 028	+ 267	944.688	697
697	698	3.0	190.2	- 007	+ 260	626.615	698
699	699	3.1	167.8	- 021	+ 256	1126.566	699
699	700	3.4	171.2	+ 048	+ 274	1162.643	700
700	701	2.7	173.9	+ 021	+ 295	1179.952	701
701	702	2.8	176.7	+ 002	+ 297	1216.295	702
702	703	3.2	179.9	+ 024	+ 321	1187.550	703
703	704	2.9	182.8	- 029	+ 292	1118.551	704
704	705	3.0	185.8	+ 022	+ 314	1140.025	705
705	706	3.5	189.3	+ 013	+ 327	1198.549	706
706	707	2.6	191.9	+ 014	+ 341	1219.895	707
707	708	2.3	194.2	+ 021	+ 362	1219.304	708

Connections at Sault Ste. Marie, Mich., with bench-marks of United States Lake Survey.—

P. B. M.—A—On Wentzel lock, Elev. 605.122

P. B. M.—B—On Poe lock, Elev. 587.678

P. B. M.—"Meridian," Elev. 606.876.

For connection at Michipicoten with Hydrographic Survey bench-mark, see Introduction.

## RESULTS OF PRECISE LEVELLING

KIPP, ALTA., to GOLDEN, B.C.

*Revised by G. S. Riley and D. McMillan*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 81 D	DISCREPANCY.		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
	81 D					3058.150	81 D
81 D	84 D	7.4	7.4	+ 032	+ 032	3102.276	84 D
84 D	85 D	4.1	11.5	+ 016	+ 048	3075.079	85 D
85 D	86 D	6.4	17.9	022	+ 026	3091.696	86 D
86 D	87 D	6.3	24.2	005	+ 021	3106.486	87 D
87 D	88 D	0.4	24.6	- 007	+ 014	3112.798	88 D
87 D	89 D	5.4	29.6	+ 022	+ 043	3225.298	89 D
89 D	90 D	4.0	33.6	+ 016	+ 059	3290.749	90 D
90 D	91 D	1.3	34.9	+ 002	+ 061	3320.100	91 D
91 D	92 D	6.2	41.1	- 001	+ 060	3450.363	92 D
92 D	93 D	5.9	47.0	+ 013	+ 073	3506.058	93 D
93 D	94 D	7.2	54.2	000	+ 073	3766.492	94 D
94 D	95 D	4.3	58.5	+ 013	+ 086	3732.968	95 D
95 D	96 D	0.4	58.9	- 007	+ 079	3724.339	96 D
96 D	97 D	2.7	61.6	- 012	+ 067	3838.602	97 D
97 D	98 D	2.6	64.2	+ 005	+ 072	3870.277	98 D
98 D	99 D	4.0	68.2	+ 022	+ 094	3821.005	99 D
99 D	100 D	6.1	74.3	+ 030	+ 124	3988.433	100 D
100 D	101 D	2.0	76.3	+ 013	+ 137	4059.478	101 D
101 D	102 D	3.1	79.4	+ 004	+ 141	4208.259	102 D
102 D	103 D	1.8	81.2	+ 009	+ 150	4224.045	103 D
103 D	104 D	2.2	83.4	+ 024	+ 174	4275.968	104 D
104 D	105 D	2.1	85.5	+ 007	+ 181	4311.156	105 D
105 D	106 D	1.8	87.3	- 016	+ 165	4367.586	106 D
106 D	107 D	1.6	88.9	- 001	+ 164	4410.254	107 D
107 D	108 D	2.7	91.6	+ 020	+ 184	4428.622	108 D
108 D	109 D	2.6	94.2	+ 016	+ 200	4457.336	109 D
109 D	110 D	2.0	96.2	- 012	+ 188	4406.208	110 D
110 D	111 D	2.0	98.2	- 011	+ 177	4308.578	111 D
111 D	112 D	2.8	101.0	- 001	+ 176	4167.831	112 D
112 D	113 D	2.5	103.5	+ 010	+ 192	4036.765	113 D
113 D	114 D	3.4	106.9	+ 006	+ 198	3955.557	114 D
114 D	115 D	3.1	110.0	+ 012	+ 210	3720.481	115 D
115 D	116 D	5.7	115.7	- 025	+ 185	3581.059	116 D
116 D	117 D	2.7	118.4	006	+ 179	3509.572	117 D
117 D	118 D	2.0	120.4	+ 006	+ 185	3468.157	118 D
118 D	119 D	3.4	123.8	003	+ 182	3408.799	119 D

## RESULTS OF PRECISE LEVELLING

KIPP, ALTA., TO GOLDEN, B.C. — *Continued**Run by G. S. Raley and D. McMillan.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 81 D	DISCREPANCY		Elevation above mean sea level	BENCH-MARK
From	To			Partial	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
119 D	120 D	3.0	126.8	+ 011	+ 193	3311.058	120 D
120 D	121 D	3.3	130.1	+ 003	+ 190	3310.123	121 D
121 D	122 D		130.1	+ 005	+ 195	3301.053	122 D
121 D	123 D	1.1	131.2	+ 023	+ 167	3279.586	123 D
123 D	124 D	2.7	133.9	+ 010	+ 157	3209.702	124 D
124 D	125 D	3.8	137.7	+ 013	+ 170	3145.32	125 D
125 D	126 D	3.2	140.9	+ 020	+ 190	3106.221	126 D
126 D	127 D	5.9	146.8	+ 011	+ 201	3034.338	127 D
127 D	128 D	4.0	150.8	+ 014	+ 212	2961.349	128 D
128 D	129 D	2.5	153.3	+ 032	+ 244	2792.003	129 D
129 D	130 D	4.7	158.0	+ 033	+ 277	2855.681	130 D
130 D	131 D	2.8	160.8	+ 018	+ 295	2707.558	131 D
131 D	132 D	0.2	161.0	+ 001	+ 291	2705.436	132 D
132 D	133 D	4.4	165.4	+ 025	+ 319	2661.577	133 D
133 D	134 D	1.9	170.3	+ 022	+ 341	2523.606	134 D
134 D	135 D	4.3	174.6	+ 017	+ 358	2473.546	135 D
135 D	136 D	1.9	179.5	+ 015	+ 373	2463.583	136 D
136 D	137 D	7.3	186.8	+ 024	+ 397	2493.512	137 D
137 D	138 D	1.7	188.5	+ 002	+ 399	2523.630	138 D
138 D	139 D	2.5	191.0	+ 016	+ 415	2526.141	139 D
139 D	140 D	3.7	197.7	+ 005	+ 410	2529.948	140 D
140 D	141 D	5.6	201.3	+ 005	+ 415	2538.475	141 D
141 D	142 D	2.6	203.9	+ 006	+ 409	2537.633	142 D
142 D	143 D	5.0	208.9	+ 019	+ 428	2604.384	143 D
143 D	144 D	3.1	212.0	+ 007	+ 435	2617.416	144 D
144 D	145 D	3.4	215.4	+ 005	+ 440	2592.925	145 D
145 D	146 D	3.9	219.3	+ 021	+ 461	2600.105	146 D
146 D	147 D	5.9	225.2	+ 007	+ 468	2613.120	147 D
147 D	148 D	2.3	227.5	+ 002	+ 470	2665.501	148 D
148 D	149 D	3.2	230.7	+ 009	+ 461	2663.185	149 D
149 D	150 D	9.3	240.0	+ 004	+ 457	2668.285	150 D
150 D	151 D	1.0	241.0	+ 010	+ 447	2676.995	151 D
151 D	152 D	11.0	252.0	+ 009	+ 456	2644.197	152 D
152 D	153 D	5.7	257.7	+ 051	+ 507	2640.726	153 D
153 D	154 D	2.1	260.8	+ 012	+ 519	2629.188	154 D
154 D	155 D	4.3	264.1	+ 010	+ 509	2619.097	155 D
155 D	156 D	9.0	273.1	+ 028	+ 537	2613.083	156 D
156 D	157 D	7.6	280.7	+ 019	+ 586	2614.550	157 D
157 D	158 D	7.7	288.4	+ 022	+ 608	2607.519	158 D



## RESULTS OF PRECISE LEVELLING.

KIPP, ALTA., TO GOLDEN, B.C.—*Concluded.**Run by G. S. Raley and D. McMullan.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 81 D	DISCREPANCY.		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total		
No	No.	Miles.	Miles.	Feet.	Feet	Feet	No
158-D	159-D	2.7	291.1	+ .001	+ .609	2601.229	159-D
159-D	160-D	6.8	297.9	- .021	+ .588	2598.619	160-D
160-D	161-D	7.7	305.6	- .013	+ .575	2591.049	161-D
161-D	162-D	3.3	308.9	+ .004	+ .579	2590.590	162-D
162-D	163-D	0.3	309.2	- .006	+ .573	2592.847	163-D
163-D	164-D	7.8	317.0	- .018	+ .555	2597.521	164-D
164-D	165-D	8.8	325.8	+ .009	+ .564	2582.033	165-D
165-D	166-D	1.5	327.3	- .013	+ .551	2579.101	166-D
166-D	273-C*	1.7	332.0	- .003	+ .548	2591.580	273-C*

\*See also elevation of this bench-mark on page 309.

RESULTS OF PRECISE LEVELLING.  
BULL RIVER TO KOOTENAY LANDING, B.C.

*Run by N. H. Smith.*

BENCH-MARK.		Distance between successive bench- marks	Distance from bench- mark 135-D	DISCREPANCY.		Elevation above mean sea level	BENCH-MARK.
From	To			Partial	Total.		
No.	No.	Miles	Miles.	Feet.	Feet.	Feet.	No.
	135-D					2473.546	135-D
135-D	167-D	1.9	1.9	+ .020	+ .020	2620.056	167-D
167-D	168-D	6.7	8.6	+ .018	+ .038	2723.528	168-D
168-D	169-D	2.8	11.4	+ .008	+ .046	2750.348	169-D
169-D	170-D	2.9	14.3	- .023	+ .023	2888.570	170-D
170-D	171-D	2.9	17.2	+ .002	+ .025	2929.369	171-D
171-D	172-D	1.8	19.0	- .016	+ .009	3003.235	172-D
172-D	173-D	0.2	19.2	- .001	+ .008	3019.608	173-D
173-D	174-D		19.2	+ .004	+ .012	3013.399	174-D
173-D	175-D	2.4	21.6	- .021	- .013	3080.361	175-D
175-D	176-D	2.9	24.5	+ .021	+ .008	3256.448	176-D
176-D	177-D	4.2	28.7	- .008	.000	3192.616	177-D
177-D	178-D	1.6	30.3	+ .006	+ .006	3140.735	178-D
178-D	179-D	2.5	32.8	- .003	+ .003	3052.584	179-D
179-D	180-D	3.5	36.3	+ .014	+ .017	3057.054	180-D
180-D	181-D	2.7	39.0	+ .010	+ .027	3051.615	181-D
181-D	182-D	2.9	41.9	+ .003	+ .030	3046.584	182-D
182-D	183-D	3.4	45.3	- .026	+ .004	3006.049	183-D
183-D	184-D	3.4	48.7	+ .017	+ .021	2978.601	184-D
184-D	185-D	2.8	51.5	+ .007	+ .028	2969.604	185-D
185-D	186-D	5.5	57.0	+ .033	+ .061	2885.327	186-D
186-D	187-D	2.1	59.1	- .020	+ .041	2831.406	187-D
187-D	188-D	4.0	63.1	.000	+ .041	2844.076	188-D
188-D	189-D	2.9	66.0	- .005	+ .036	2895.026	189-D
189-D	190-D	4.4	70.4	+ .006	+ .042	2650.748	190-D
190-D	191-D	2.2	72.6	+ .016	+ .058	2550.985	191-D
191-D	192-D	2.3	74.9	- .001	+ .057	2440.468	192-D
192-D	193-D	3.1	78.0	- .009	+ .048	2267.750	193-D
193-D	194-D	4.2	82.2	+ .033	+ .081	2087.332	194-D
194-D	195-D	4.5	86.7	+ .023	+ .104	1986.302	195-D
195-D	196-D	0.8	87.5	+ .010	+ .114	1944.967	196-D
196-D	197-D	4.7	92.2	- .034	+ .080	1798.797	197-D
197-D	198-D	3.7	95.9	- .022	+ .058	1793.914	198-D
198-D	199-D	1.0	88.5	- .016	+ .068	1883.951	199-D
199-D	200-D	3.4	91.9	+ .012	+ .110	1853.324	200-D
200-D	201-D	3.4	95.3	+ .009	+ .139	1827.310	201-D
201-D	202-D	1.9	97.2	+ .001	+ .140	1816.340	202-D

## RESULTS OF PRECISE LEVELLING

BULL RIVER TO KOOTENAY LANDING, B.C. — *Continued.**Run by N. H. Smith.*

BENCH-MARK.		Distance between successive bench- marks	Distance from bench- mark 135-D	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles	Miles	Feet	Feet.	Feet.	No.
202-D	203-D	2.5	99.7	-.022	+ 118	1786.853	203-D
203-D	204-D	0.9	100.6	+.005	+ 123	1773.349	204-D
204-D	205-D		100.6	+.002	+ 125	1774.669	205-D

Connection at Porthill with bench-mark of U.S. Coast and Geodetic Survey:—

B.M.—V-10, iron pipe 4 ft. west of international boundary monument No. 207, Elev. 1794.336.

## RESULTS OF PRECISE LEVELLING.

## FIELD TO REVELSTOKE, B.C.

*Run by G. S. Raley and D. McMillan.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 51-D	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial	Total		
No	No	Miles.	Miles.	Feet	Feet	Feet.	No
	260-C		137.2		+ .097	4074.638	260-C
260-C	261-C	3.8	141.0	+ .023	+ .120	3923.040	261-C
261-C	262-C	2.4	143.4	+ .017	+ .137	3785.203	262-C
262-C	263-C	3.0	146.4	- .010	+ .127	3700.990	263-C
263-C	264-C	2.6	149.0	+ .014	+ .141	3696.099	264-C
264-C	265-C	4.8	153.8	+ .010	+ .151	3649.049	265-C
265-C	266-C	3.0	156.8	- .008	+ .143	3484.402	266-C
266-C	267-C	2.1	158.9	- .010	+ .133	3308.334	267-C
267-C	268-C	2.8	161.7	+ .007	+ .140	3224.611	268-C
268-C	269-C	1.2	162.9	.000	+ .140	3153.075	269-C
269-C	270-C	1.6	164.5	- .008	+ .132	3041.706	270-C
270-C	271-C	3.8	168.3	+ .005	+ .137	2752.568	271-C
271-C	272-C	2.1	170.4	- .005	+ .132	2643.855	272-C
272-C	273-C*	1.7	172.1	- .010	+ .122	2591.465	273-C*
273-C*	274-C	2.0	174.1	+ .008	+ .130	2566.916	274-C
274-C	275-C	2.0	176.1	+ .004	+ .134	2557.387	275-C
275-C	276-C	3.0	179.1	+ .011	+ .145	2554.282	276-C
276-C	277-C	3.0	182.1	+ .022	+ .167	2575.942	277-C
277-C	278-C	3.2	185.3	+ .040	+ .207	2557.044	278-C
278-C	279-C	3.0	188.3	+ .023	+ .230	2571.953	279-C
279-C	280-C	1.4	189.7	- .001	+ .229	2555.582	280-C
280-C	281-C	1.7	191.4	- .003	+ .226	2591.855	281-C
281-C	282-C	3.4	194.8	.000	+ .226	2502.041	282-C
282-C	283-C	1.5	196.3	- .007	+ .219	2455.639	283-C
283-C	284-C	3.8	200.1	.000	+ .219	2432.613	284-C
284-C	285-C	3.1	203.2	+ .015	+ .244	2552.448	285-C
285-C	286-C	2.0	205.2	- .006	+ .228	2607.820	286-C
286-C	287-C	3.8	209.0	+ .015	+ .243	3009.581	287-C
287-C	288-C	2.0	211.0	- .009	+ .234	3230.756	288-C
288-C	289-C	2.2	213.2	- .006	+ .228	3486.262	289-C
289-C	290-C	3.6	216.8	- .002	+ .226	3896.121	290-C
290-C	291-C	3.3	220.1	- .021	+ .205	4225.922	291-C
291-C	292-C	2.0	222.1	+ .014	+ .219	4350.362	292-C
292-C	293-C	1.0	223.1	- .007	+ .212	4222.220	293-C
293-C	294-C	1.0	224.1	+ .014	+ .226	4096.983	294-C
294-C	295-C	2.8	226.9	+ .001	+ .227	3795.070	295-C
295-C	296-C	1.9	228.8	+ .002	+ .229	3583.511	296-C
296-C	297-C	2.9	231.7	+ .018	+ .247	3400.350	297-C
297-C	298-C	2.9	234.6	+ .004	+ .251	3104.002	298-C
298-C	299-C	1.9	236.5	- .002	+ .249	2982.068	299-C

\*See also elevation of this bench-mark on page 306.

RESULTS OF PRECISE LEVELLING  
FIELD TO REVELSTOKE, B.C.—*Concluded*

*Run by G. S. Raley and D. McMillan*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 51-D	DISCREPANCY		Elevation above mean sea level	BENCH-MARK
From	To			Partial	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
299-C	300-C	2.7	239.2	+ .008	+ .257	2759.404	300-C
300-C	301-C	1.8	241.0	+ .008	+ .265	2644.203	301-C
301-C	302-C	3.5	244.5	+ .016	+ .281	2415.733	302-C
302-C	303-C	1.9	246.4	- .003	+ .278	2224.159	303-C
303-C	304-C	1.4	247.8	.004	+ .274	2120.964	304-C
304-C	305-C	3.6	251.4	+ .008	+ .282	1959.266	305-C
305-C	306-C	3.7	255.1	+ .015	+ .297	1944.805	306-C
306-C	307-C	1.9	257.0	+ .002	+ .299	1853.800	307-C
307-C	308-C	3.4	260.4	+ .003	+ .302	1693.148	308-C
308-C	309-C	2.4	262.8	.000	+ .302	1646.930	309-C
309-C	310-C	1.8	264.6	+ .002	+ .304	1610.926	310-C
310-C	311-C	2.7	267.3	- .027	+ .277	1498.698	311-C
311-C	312-C	0.3	267.6	+ .001	+ .278	1500.262	312-C
312-C	313-C	0.3	267.9	- .005	+ .273	1500.294	313-C
312-C	314-C	0.6	268.2	- .012	+ .266	1512.387	314-C

## RESULTS OF PRECISE LEVELLING.

## EDMONTON TO JASPER, ALTA.

*Run by N. H. Smith.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 28-D.	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
	60-H		331.3		+141	2168.315	60-H
60-H	62-H	6.5	337.8	-026	+115	2227.347	62-H
62-H	63-H	6.2	344.0	-030	+085	2316.466	63-H
63-H	64-H	7.3	351.3	+038	+123	2229.926	64-H
64-H	65-H	4.2	355.5	-016	+107	2327.306	65-H
65-H	66-H	4.5	360.0	-000	+107	2405.293	66-H
66-H	67-H	4.7	364.7	+013	+120	2454.116	67-H
67-H	68-H	6.2	370.9	-020	+100	2375.798	68-H
68-H	69-H	4.9	375.8	+032	+132	2398.127	69-H
69-H	70-H	9.3	385.1	-012	+120	2433.818	70-H
70-H	71-H	4.3	389.4	+013	+133	2443.358	71-H
71-H	72-H	9.5	398.9	-005	+128	2556.447	72-H
72-H	73-H	7.1	406.0	+009	+137	2586.859	73-H
73-H	74-H	5.0	411.0	+017	+154	2606.514	74-H
74-H	75-H	7.1	418.1	-047	+107	2597.338	75-H
75-H	76-H	2.4	420.5	+005	+112	2609.379	76-H
76-H	77-H	8.4	428.9	-002	+110	2701.454	77-H
77-H	78-H	7.6	436.8	-013	+097	2746.646	78-H
78-H	79-H	8.2	445.0	+030	+127	2841.548	79-H
79-H	80-H	9.0	454.0	+048	+175	2874.836	80-H
80-H	81-H	6.8	460.8	+038	+213	3043.192	81-H
81-H	82-H	0.4	461.2	+008	+221	2984.703	82-H
82-H	83-H	6.0	467.2	+022	+243	3062.350	83-H
83-H	84-H	5.7	472.9	+042	+285	3164.177	84-H
84-H	85-H	6.0	478.9	+019	+304	3243.383	85-H
85-H	86-H	7.8	486.7	+008	+312	3390.290	86-H
86-H	87-H	8.0	494.7	+005	+317	3558.488	87-H
87-H	88-H	5.4	500.1	+018	+335	3490.786	88-H
88-H	89-H	2.8	502.9	+006	+341	3477.472	89-H
89-H	90-H	5.9	508.8	-012	+129	3467.128	90-H
90-H	91-H	7.1	516.2	+001	+330	3320.343	91-H
91-H	92-H	2.7	518.9	+003	+335	3265.260	92-H
92-H	93-H	3.0	521.9	-001	+332	3292.605	93-H
93-H	94-H	2.9	524.8	+022	+354	3305.813	94-H
94-H	95-H	4.1	528.9	-005	+340	3305.551	95-H
95-H	96-H	6.4	535.3	+025	+374	3252.925	96-H
96-H	97-H	6.2	541.5	+029	+403	3267.050	97-H
97-H	98-H	2.6	544.1	+017	+420	3293.750	98-H
98-H	99-H	4.6	548.7	-017	+403	3295.985	99-H
99-H	100-H	4.3	553.0	-020	+383	3302.979	100-H
100-H	101-H	2.3	555.3	-014	+369	3316.640	101-H

RESULTS OF PRECISE LEVELLING  
EDMONTON TO JASPER, ALTA.—*Concluded*

*Revised by A. H. Smith*

From	BENCH-MARK	Distance between successive level marks	Distance from bench- mark 28. D	DISCREPANCY		Elevation, above mean sea level	BENCH-MARK
				Partial	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet.	No.
101-H	102-H	5.0	558.3	+0.03	+374	3345.163	102-H
102-H	103-H	5.6	561.9	+0.16	+358	3420.654	103-H
103-H	104-H	5.4	565.3	+0.03	+361	3483.531	104-H

Checked by J. C. Thompson, Dominion of Irrigation, Branch, Dept. of the Interior.  
On N.W. corner of 1st and 4th Sts. W. 6th meridian post. Elev. 3382.654.

TABLE II-A.

RESULTS OF PRECISE LEVELLING.

ST. STEPHEN, N.B., TO RIVIERE-DU-LOUP, Q'É

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 1-B.	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
	1 B					53 578	1 B
1-B	2 B	1 0	1 0	+ 005	+ 005	26 064	2 B
2-B	3 B		1 0	+ 001	+ 006	23 239	3 B
3-B	4 B	5 3	6 3	+ 011	+ 017	82 584	4 B
4-B	5 B	1 7	11 0	+ 013	+ 030	1 118	5 B
5-B	6 B	4 7	15 7	+ 008	+ 038	275 905	6 B
6-B	B	5 8	21 5	- 025	+ 013	216 340	7 B
7-B	B	1 7	26 2	- 028	- 015	313 255	8 B
8-B	9 B	5 0	31 2	- 028	- 043	412 622	9 B
9-B	10 B	5 0	36 2	- 024	- 066	421 679	10 B
10-B	11 B	5 0	41 2	+ 017	- 049	461 832	11-B
11-B	12 B	5 5	46 7	+ 010	- 039	382 637	12 B
12-B	13 B		46 7	000	- 039	388 423	13 B
13-B	14 B	50 2	51 4	+ 018	- 031	481 243	14 B
14-B	15 B	6 0	57 1	+ 018	- 014	541 108	15 B
15-B	16 B	6 3	63 7	- 018	- 031	563 625	16 B
16-B	17 B	7 2	67 9	+ 025	- 006	461 608	17 B
17-B	18 B	6 2	74 1	- 008	- 014	412 210	18 B
18-B	19 B	1 0	78 1	026	- 040	549 955	19 B
19-B	20 B	5 5	83 6	- 017	- 057	548 292	20-B
20-B	21 B	4 6	86 2	+ 013	- 044	544 508	21-B
21-B	22 B	0 4	86 6	- 002	- 046	530 198	22 B
22-B	23 B	4 5	86 1	- 017	- 071	392 075	23-B
23-B	24 B	4 5	90 6	+ 022	- 072	189 781	24 B
24-B	25 B	2 0	92 6	+ 003	- 019	142 014	25-B
25-B	26 B	0 5	93 1	+ 004	- 015	197 885	26 B
26-B	27 B		93 1	+ 004	- 012	186 200	27 B
27-B	28 B	2 3	95 4	- 010	- 055	149 337	28 B
28-B	29 B	4 0	99 4	+ 016	- 039	132 082	29 B
29-B	30 B	4 0	103 4	- 020	- 359	144 431	30 B
30-B	31 B	2 8	106 2	+ 018	- 041	158 366	31 B
31-B	32 B	6 0	112 2	+ 015	- 026	172 631	32 B
32-B	33 B	3 0	115 2	- 015	- 041	181 791	33 B



## RESULTS OF PRECISE LEVELLING.

ST. STEPHEN, N.B. TO RIVIERE-DU-LOUP, QUE. *Continued.*

BENCH-MARK		Distance between successive bench- marks	Distance from bench- mark 1-B	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
33-B	34-B	1.5	119.7	+ 013	028	290.344	34-B
34-B	35-B	3.0	123.2	- 018	046	292.842	35-B
35-B	36-B	4.0	127.7	019	065	294.799	36-B
36-B	37-B	5.8	133.5	004	069	297.576	37-B
37-B	38-B	6.9	140.4	041	100	285.937	38-B
38-B	39-B	1.5	141.9	001	101	257.296	39-B
39-B	40-B	0.3	142.2	002	103	261.503	40-B
40-B	41-B	5.5	147.7	+ 002	101	279.292	41-B
41-B	42-B	1.7	152.4	002	103	373.065	42-B
42-B	43-B	1.5	152.2	- 020	081	467.970	43-B
43-B	44-B	7.0	155.9	010	091	334.720	44-B
44-B	45-B	1.0	160.9	- 002	089	287.758	45-B
45-B	46-B	1.5	166.4	017	106	513.117	46-B
46-B	47-B	1.5	167.9	- 002	104	467.698	47-B
47-B	48-B	1.2	172.1	- 001	103	497.302	48-B
48-B	49-B	1.5	176.6	- 031	072	442.633	49-B
49-B	50-B	5.0	181.6	014	086	440.426	50-B
50-B	51-B	2.5	184.1	- 015	071	451.834	51-B
51-B	52-B	1.0	187.1	- 019	052	439.295	52-B
52-B	53-B	1.0	191.1	- 002	050	459.917	53-B
53-B	54-B	1.5	191.6	- 021	029	457.010	54-B
54-B	55-B	1.8	198.4	- 015	044	478.467	55-B
55-B	56-B	1.8	200.2	- 015	027	475.713	56-B
56-B	57-B	1.0	202.2	- 006	024	514.934	57-B
57-B	58-B	2.0	205.2	014	025	482.942	58-B
58-B	58-B*	0.1	205.7	- 007	002	474.642	58-B*
58-B*	59-B	0.1	205.7	- 004	028	461.846	59-B
59-B	60-B	1.5	207.7	- 009	026	485.244	60-B
60-B	61-B	18.7	326.4	- 019	045	531.111	61-B
61-B	62-B	1.4	329.7	021	034	543.148	62-B
62-B	63-B	1.2	331.9	004	048	521.975	63-B
63-B	64-B	1.0	333.9	- 005	046	512.770	64-B
64-B	65-B	1.4	341.2	- 014	033	514.326	65-B
65-B	66-B	6.2	344.4	- 027	069	799.814	66-B
66-B	67-B	1.5	344.9	014	046	587.149	67-B
67-B	68-B	1.0	345.9	- 006	032	1118.094	68-B
68-B	69-B	1.5	346.4	- 009	047	1295.992	69-B

## RESULTS OF PRECISE LEVELLING.

ST. STEPHEN, N.B., TO RIVIERE-DU-LOUP, QUE. *—Concluded.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark I-B.	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial	Total		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
70 B	71 B	1.5	261.9	— 007	— 050	1165.164	71 B
71 B	72 B	2.5	267.4	— 022	— 072	1081.000	72 B
72 B	73 B	5.5	272.9	+ 021	— 051	846.736	73 B
73 B	74 B	5.5	278.4	— 024	— 075	653.057	74 B
74 B	75 B	5.5	285.9	+ 032	— 043	338.673	75 B
75 B	76 B	2.5	286.4	+ 023	— 020	307.535	76 B
76 B	77 B	1.0	287.4	— 013	— 033	313.608	77 B
77 B	78 B	0.2	287.6	— 001	— 034	442.589	78 B

(See also elevation of this bench-mark on page 292)

## RESULTS OF PRECISE LEVELLING

## BRUNSWICK TO ST. JOHN, N.B.

BENCH-MARK		Distance between successive bench- marks	Distance from bench- mark to B.	DISCREPANCY		Elevation above mean sea level	BENCH-MARK
From	To			Partial	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
6 B	6 B					275.905	6 B
79 B	79 B	1.7	1.7	+ 0.28	+ 0.28	127.400	79 B
80 B	80 B	5.0	7.7	+ 0.18	+ 0.46	159.587	80 B
81 B	81 B	5.5	13.2	+ 0.24	+ 0.70	98.941	81 B
82 B	82 B	3.0	16.2	+ 0.19	+ 0.89	68.744	82 B
83 B	83 B	1.5	17.7	+ 0.21	+ 1.10	88.274	83 B
84 B	84 B	3.0	20.7	+ 0.21	+ 1.31	128.680	84 B
85 B	85 B	1.8	22.5	+ 0.28	+ 1.59	262.276	85 B
86 B	86 B	1.5	24.0	+ 0.15	+ 1.74	88.000	86 B
87 B	87 B	1.5	25.5	+ 0.04	+ 1.78	88.900	87 B
88 B	88 B	1.4	26.9	+ 0.06	+ 1.84	179.400	88 B
89 B	89 B	1.5	28.4	+ 0.05	+ 1.89	60.780	89 B
90 B	90 B	1.0	29.4	+ 0.24	+ 2.13	36.800	90 B
91 B	91 B	1.0	30.4	+ 0.20	+ 2.33	11.000	91 B
92 B	92 B	2.5	32.9	+ 0.29	+ 2.62	15.028	92 B
93 B	93 B	1.7	34.6	+ 0.01	+ 2.63	294.967	93 B
94 B	94 B	1.0	35.6	+ 0.26	+ 2.89	204.662	94 B
95 B	95 B	5.0	40.6	+ 0.02	+ 2.91	68.498	95 B
96 B	96 B	2.5	43.1	+ 0.26	+ 3.17	86.440	96 B
97 B	97 B	1.7	44.8	+ 0.08	+ 3.25	21.776	97 B
98 B	98 B	0.5	45.3	+ 0.08	+ 3.33	20.770	98 B
99 B	99 B	0.5	45.8	+ 0.07	+ 3.40	12.722	99 B
100 B	100 B	1.8	47.6	+ 0.08	+ 3.48	0.000	100 B

## RESULTS OF PRECISE LEVELLING.

ROUSE POINT, N.Y., TO SHERBROOKE, QUE

BENCH-MARK		Distance between successive bench- marks	Distance from bench- mark	DISCREPANCY.		Elevation above mean sea level	BENCH-MARK.
From.	To			Partial	Total		
No.	No.	Miles	Miles	Feet.	Feet.	Feet.	No.
	81	3.5	3.5	.022	-.022	107.950	81
81	79	7.2	10.7	+.016	-.006	114.595	79
79	78	6.0	16.5	.059	-.065	140.678	78
78	77	5.0	21.5	+.020	-.042	121.014	77
77	76	1.5	23.0	+.015	-.027	122.124	76
76	75	0.3	23.3	.005	.032	123.885	75
76	74	0.5	23.5	.008	.035	103.856	74
74	72	6.3	29.8	-.013	-.022	182.229	72
72	71	2.3	32.1	.008	.030	159.204	71
71	62	4.4	36.5	.008	.038	195.121	62
62	61	3.0	39.5	+.012	.026	225.117	61
61	60	2.3	41.8	-.016	.010	261.818	60
60	59	1.8	43.6	.034	-.044	377.565	59
59	58	3.9	50.5	+.005	-.039	357.644	58
58	57	1.8	52.3	.000	-.039	432.236	57
57	56	1.2	59.5	.042	.081	589.078	56
56	47	4.5	64.0	+.051	-.030	703.135	47
47	46	1.9	64.9	+.011	-.019	731.218	46
46	45	4.5	68.4	-.007	-.012	859.930	45
45	44	2.7	71.1	-.012	.000	914.749	44
44	43	4.4	75.5	-.005	-.005	934.811	43
43	42	4.4	78.8	-.015	.010	814.758	42
42	41	5.0	81.8	-.037	-.027	689.780	41
41	41 A	0.5	82.3	.002	-.020	707.298	41 A
41	40	0.1	81.9	.001	.028	689.123	40
40	39	1.1	83.3	+.002	.026	676.635	39
39	38	0.2	89.5	.030	.056	651.376	38
38	37	1.7	91.2	.055	.111	660.471	37
37	36	3.0	99.2	.051	.162	595.667	36
36	35	1.2	100.4	-.011	.173	611.198	35
35	1	0.5	100.9	.004	.177	541.862	1

United States bench mark at Chautauque, Rouse Point, N. Y.

Connected with P. 198 West. Depot's bench mark.

B.M. 40-1 D. &amp; H. bench, Rouse Point Elev. 123.761

B.M. 19-II G. I. R. bench, Elev. 109.460

B.M. 45-III G. I. R. bench, Elev. 129.930

B.M. 19-IV G. I. R. bench, Elev. 137.148

B.M. 40-CXXX, same bench mark, Elev. 125.776

## RESULTS OF PRECISE LEVELLING.

## FARNHAM TO ST. ARMAND, QUE

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 62.	DISCREPANCY		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
	62					195.121	62
62	63	0.2	0.2	- .002	- .002	193.031	63
63	64	0.1	0.3	- .003	.005	192.787	64
62	65	9.3	9.3	+ .001	- .001	186.334	65
65	66	2.4	11.7	+ .920	+ .021	178.185	66
66	67	2.6	14.3	- .006	+ .015	167.611	67
67	68	6.4	20.7	+ .010	- .025	123.626	68
68	69	0.6	21.3	+ .003	+ .028	107.323	69
69	70	0.7	22.0	+ .003	+ .031	198.161	70

## RESULTS OF PRECISE LEVELLING

## FOSTER TO ABERCORN, QUE

BENCH-MARK		Distance between successive bench- marks.	Distance from bench- mark 47.	DISCREPANCY		Elevation above mean sea level	BENCH-MARK
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
	47					703.135	47
47	48	1.2	1.2	- .033	.033	566.742	48
48	49	1.2	2.4	- .038	- .074	690.592	49
49	50	1	3.4	- .025	.096	679.176	50
50	51	1.7	5.1	+ .015	- .081	554.849	51
51	52	3.4	8.5	+ .010	- .071	591.272	52
52	53	1.0	9.5	+ .002	- .069	492.870	53
53	54	1.2	10.7	+ .014	.055	485.656	54
54	55	1.1	11.8	+ .013	.042	492.526	55

## RESULTS OF PRECISE LEVELLING.

SHERBROOKE, QUE., TO NORTON MILLS, VERMONT.

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark 1	DISCREPANCY.		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total.		
No.	No.	Miles.	Miles.	Feet.	Feet.	Feet.	No.
	1					541.862	1
1	2			-001	-001	533.543	2
2	3	0.2	0.2	-007	-008	484.318	3
3	4	1.9	2.1	+008	-000	498.756	4
4	5	0.7	2.8	-003	-003	488.547	5
5	6	1.4	4.2	+003	-000	495.522	6
6	7	1.2	5.4	-010	+010	495.050	7
7	8	3.5	8.9	-056	-046	597.624	8
8	9	1.5	10.4	+008	-038	643.148	9
9	10	2.7	13.1	+018	-020	707.196	10
10	11	2.0	15.1	+015	-005	747.534	11
11	13	2.1	17.2	+029	+024	829.940	13
13	14	4.8	22.0	+036	+060	1005.416	14
14	15	0.4	22.4	+017	+077	963.679	15
15	16		22.4	-000	+077	963.015	16
14	17	1.1	23.1	+018	+078	1040.109	17
17	18	1.4	24.5	+022	+100	1069.878	18
18	19	1.2	25.7	+007	+107	1101.157	19
19	21	2.8	28.5	+025	+132	1166.804	21
21	22	0.5	29.0	-009	+123	1187.171	22
22	23	2.6	31.6	+008	+131	1247.750	23
23	24		31.6	-000	+131	1213.468	24
24	25		31.6	-000	+131	1212.040	25

RESULTS OF PRECISE LEVELLING  
ROUSE POINT, N.Y., TO COLBORNE, ONT.

BENCH-MARK		Distance between successive bench- marks	Distance from bench- mark to	DISCREPANCY		Elevation above mean sea-level	BENCH-MARK
From	To			Partial	Total		
No.	No.	Miles	Miles	Feet	Feet	Feet	No.
80	81	1.1	1.1	0.22	0.22	107.950	80
81	83	8.9	12.2	0.03	0.06	115.796	81
83	85	9.2	21.4	0.02	0.06	192.005	83
85	86	7.2	28.6	0.10	0.06	300.003	85
86	87	3.6	32.2	0.06	0.00	192.917	86
87	88	6.1	38.3	0.007	0.007	123.209	87
88	89	8.9	47.2	0.01	0.003	190.729	88
89	90	5.5	52.7	0.11	0.08	162.081	89
90	91	1.9	54.6	0.15	0.21	157.040	90
91	92	7.8	58.4	0.08	0.29	162.846	91
92	96	1.4	59.8	0.17	0.46	186.360	92
93	94	3.0	62.8	0.021	0.25	193.501	93
94	95	2.1	64.9	0.06	0.51	213.997	94
95	96	2.8	67.7	0.005	0.26	226.446	95
96	97	3.9	71.6	0.001	0.27	263.469	96
97	98	3.3	74.9	0.23	0.48	268.499	97
98	99	3.5	78.4	0.03	0.35	277.283	98
99	100	2.4	80.7	0.20	0.55	270.914	99
100	101	2.8	83.5	0.009	0.55	286.115	100
101	102	3.2	86.7	0.12	0.68	317.830	101
102	103	5.0	91.7	0.00	0.58	335.602	102
103	104	1.7	93.4	0.01	0.59	327.566	103
104	105	1.1	97.5	0.02	0.91	297.254	104
105	106	1.5	101.1	0.07	0.84	273.786	105
106	107	1.5	105.6	0.25	1.09	247.071	106
107	108	3.3	108.9	0.05	1.14	242.401	107
108	109	2.6	111.5	0.08	1.12	268.870	108
109	110	3.7	115.2	0.05	1.58	236.268	109
110	111	1.4	116.5	0.01	1.58	278.776	110
111	112	1.2	119.7	0.11	1.67	270.425	111
112	113	1.9	121.6	0.11	1.97	329.122	112
113	114	1.9	126.6	0.02	1.99	307.509	113
114	115	1.4	130.0	0.01	1.98	307.509	114
115	116	1.4	134.4	0.09	2.07	308.898	115
116	117	2.7	136.8	0.02	2.15	300.774	116
117	118	1.6	141.4	0.02	2.15	300.235	117
118	119	5.4	146.6	0.09	2.64	288.676	118
119	120	1.5	148.1	0.02	2.85	310.837	119
120	121	7.4	151.4	0.08	2.94	284.565	120
121	122	2.4	153.8	0.02	2.96	302.934	121
122		2.9	156.7	0.00	2.95	327.677	122

## RESULTS OF PRECISE LEVELLING.

ROUSE POINT, N.Y., TO COLEBORNE, ONT.—*Continued.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark ⊕	DISCREPANCY		Elevation above mean sea level.	BENCH-MARK.
From	To			Partial.	Total		
No.	No.	Miles	Miles.	Feet.	Feet	Feet.	No.
122	123*	2.6	159.3	+ .013	-.192	295.634	123*
123*	124	2.0	164.3	+ .011	-.181	283.149	124
124	125	2.9	164.2	+ .009	-.172	285.823	125
125	126	2.7	166.9	-.021	-.193	320.389	126
126	127	3.4	170.3	-.017	-.210	289.107	127
127	128	3.1	173.4	+ .018	-.192	319.552	128
128	129	2.7	176.1	-.024	-.216	315.413	129
129	130	4.2	180.3	-.017	-.233	324.846	130
130	131	0.7	181.0	+ .001	-.232	375.174	131
131	132	3.5	184.5	-.032	-.264	313.225	132
132	133	2.2	186.7	-.016	-.280	324.320	133
133	134	3.8	190.5	+ .009	-.271	292.687	134
134	135	3.0	193.5	-.022	-.293	342.482	135
135	136	3.3	196.8	+ .024	-.269	350.746	136
136	137	2.9	199.7	+ .013	-.256	314.551	137
137	138	4.2	203.9	-.038	-.294	309.785	138
138	139†	3.7	207.6	-.003	-.297	276.940	139†
139†	141	2.3	209.9	-.036	-.333	263.699	141
141	141-A		209.9	+ .003	-.330	275.986	141-A
141	142		209.9	-.000	-.333	258.688	142
139†	140	2.8	210.4	-.018	-.315	254.646	140
140	143	2.9	213.3	+ .003	-.312	264.945	143
143	144	2.1	215.4	+ .002	-.310	271.991	144
144	145	3.0	218.4	-.001	-.311	314.191	145
145	146	1.3	222.7	-.030	-.341	327.140	146
146	147	4.0	226.7	-.023	-.364	340.144	147
147	148	3.9	230.6	+ .016	-.348	296.034	148
148	149	2.8	233.4	+ .016	-.332	314.333	149
149	150	0.4	233.8	-.006	-.338	316.141	150
150	150-A	0.4	244.2	+ .005	-.333	304.699	150-A
150-A	150-A 2	0.1	244.3	-.006	-.339	294.646	150-A 2
150	151	3.4	237.2	-.008	-.346	290.623	151
151	152	1.4	241.6	+ .024	-.322	338.579	152
152	153	5.3	246.9	-.008	-.330	284.481	153
153	154	1.5	248.4	+ .007	-.323	337.166	154
154	155	2.9	251.3	-.024	-.347	317.206	155

\*See also elevation of this bench-mark on page 298.

†See also elevation of this bench-mark on page 300.



## RESULTS OF PRECISE LEVELLING

ROUSE POINT, N.Y., TO COLBORNE, ONT.—*Continued.*

BENCH-MARK.		Distance between successive bench- marks.	Distance from bench- mark ⊕	DISCREPANCY.		Elevation above mean sea level	BENCH-MARK.
From	To			Partial.	Total.		
No	No	Miles	Miles	Feet	Feet.	Feet.	No
155	156*	1.2	255.5	+ 0.09	- 338	288.567	156*
156*	157	1.5	257.0	- 0.01	- 339	257.005	157
157	157 A	0.1	257.1	+ 0.13	- 326	261.329	157 A
157 A	157 A 2	0.3	257.4	+ 0.08	318	250.813	157 A 2
156*	158	2.9	258.4	+ 0.12	- 326	307.205	158
158	159	2.6	261.0	+ 0.23	- 303	306.755	159
159	160	2.8	263.8	+ 0.01	- 302	306.251	160
160	161	3.8	267.6	- 0.35	- 337	283.887	161
161	162	4.5	272.1	- 0.23	- 360	314.101	162
162	163	3.8	275.9	+ 0.03	- 357	306.996	163
163	164	2.1	278.0	+ 0.03	- 354	310.872	164
164	165	3.1	281.1	+ 0.03	- 351	283.401	165
165	166	2.7	283.8	+ 0.07	- 344	298.946	166

\*See also elevation of this bench-mark on page 301.

## Connections with Public Works Dept's bench-marks

Between Rouse Point and Coteau Jet

DCL.....	Elev. 123.761	DCCCXV.....	Elev. 129.406
DCL.....	" 109.310	DCCCXIV.....	" 129.363
DCCCXIX.....	" 156.782	DCCCXIII.....	" 135.688
DCCCXX.....	" 161.906	DCCCXII.....	" 130.097
DCCCXXIV.....	" 182.666	DCCCX.....	" 153.200
DCCCXXV.....	" 187.814	DCCCXVII.....	" 142.900
DCCCXXVI.....	" 192.284	DCCCX.....	" 157.285
DCCCXXV.....	" 204.298	DCCCXVII.....	" 174.176
DCCCXXVIII.....	" 137.755	DCCCXXVIII.....	" 160.901

East and west of Coteau Jet, on G.T.R. main line

DCCCXLIV—Bridge over Dehsie river, Elev. 158.849

DLXXVIII—Bridge at St. Zotique, Elev. 154.703

DLXXVII—Bridge at River Beaudette, Elev. 169.517

Between Trenton and Brighton

MCXCIX=G.S.C. bench-mark 161

MCXCVII=G.S.C. bench-mark 163

For connection at Kingston with Hydrographic Survey levels, see Introduction

TABLE III.

## RAIL ELEVATIONS, ST. ANSELME, QUE., TO EDMUNDSTON, N.B.

(Elevations taken in 1915 and 1916).

National Transcontinental Ry.—St. Anselme.		FEET
"	Ste. Claire	566.7
"	Frampton	682.9
"	Etchemin river; water, July 17, 1915, 710.0; rail	746.0
"	Ste. Malachie	767.5
"	Abenakis	769.8
"	Abenakis river; water, July 21, 1915, 822.0; rail	837.3
"	St. Damien	871.3
"	St. Lazare	935.7
"	Armagh	959.9
"	Rivière-du-Pin; water, July 24, 1915, 984; rail	998.1
"	St. Euphémie	1046.6
"	Rosario	1115.9
"	Langelier (water-tank)	1215.4
"	Méchant-pouce river; water, July 28, 1915, 1185.1; rail	1315.2
"	Ste. Appoline	1227.3
"	Bras d'Apie	1233.0
"	Bras d'Apie river (east); water, July 28, 1915, 1177.4; rail	1215.8
"	Therien	1208.9
"	Monk	1266.2
"	Lafontaine	1162.1
"	Lefebvre	1092.2
"	Hollida	1202.7
"	Bretagne	1110.4
"	Rivière-du-Loup; water, Aug. 7, 1916, 966.2; rail	1093.6
"	River Manie (station)	1010.9
"	River Manie; water, Aug. 8, 1916, 1066.6; rail	1090.5
"	Lapointe	1087.1
"	Picard	1139.6
"	Pelletier	1207.1
"	St. Eleuthère	1260.3
"	St. Francis river; water, Aug. 21, 1916, 678; rail	946.7
"	Estcourt	715.0
"	Blue river; water, Aug. 24, 1916, 591; rail	710.5
"	Blue River (station)	650.5
"	Long Lake	670.0
"	Glendyne	655.1
"	Long lake narrows; water, Sept. 1, 1916, 648.4; rail	675.2
"	Courchesne	671.4
"	Lac Baker	728.3
"	Caron Brook	682.3
"	Baker brook; water, Sept. 6, 1916, 493.4; rail	608.6
"	Baker Brook (station)	516.1
"	Temiscouata railway (diamond crossing)	517.4
"	St. Hilaire	521.6
		493.1



## RAIL ELEVATIONS, HARLAKA JUNCTION TO RIVIERE-DU-LOUP, Q. L.

Elevations taken in 1915

	FEET
Intercolonial Railway—Harlaka Junction	241.2
" Ville Marie	324.4
" Lake Beauport, water, Aug. 8, 1915	320.2
" St. Charles Junction	297.1
" Beaver river, water, Aug. 12, 1915, 121 ft. rail	171.4
" La Durantaye	172.0
" St. Valier	156.7
" St. Francois	134.8
" St. Pierre	132.1
" Montmagny	55.0
" Rivieres-du-Sud, water, Aug. 19, 1915, 44 ft. rail	56.8
" Riv. St. Nicholas riviere-du-Sud, water, Aug. 19, 1915, 45 ft. rail	57.1
" Cap St. Ignace	130.1
" L. Assommoir	118.3
" L. Isle	104.0
" Port-Saint-James	99.9
" St. Jean Port-Joli	176.7
" Figeac Road	163.5
" St. Louis	120.4
" Pointe-Rouge	97.6
" St. Anne	101.4
" St. Pieuvre	54.3
" Riviere-Ouelle, water, Sept. 8, 1915, 18 ft. rail	42.8
" Riviere-Ouelle Junction	46.9
" St. Philippe-de-Neri	143.9
" St. Paschal	192.4
" Dossart	301.5
" Ste. Helene	319.1
" St. Andre	345.9
" St. Alexandre	369.7
" Old Lake Road	349.9
" Rivieres-du-Loup	315.1

## RAIL ELEVATIONS, OTTAWA TO RENFREW, ONT.

Elevations taken in 1915

	FEET
Ontario Pacific Railway—Ottawa, Broad Street station	181.0
" Ottawa river below Deschênes rapids, water, May 29, 1915	182.4
" Britannia	202.4
" Lake Deschênes, water, May 29, 1915	192.5
" Ottawa river below Deschênes rapids, water, May 29, 1915, C. P. R. rail	217.4
" Ottawa river below Deschênes rapids, water, May 29, 1915, C. P. R. rail	272.7
" St. Charles	398.6
" Arden	448.6
" Carleton Place	150.2
" Merrickville, water, May 29, 1915, 128 ft. rail	145.9
" Merrickville	397.4
" Merrickville, water, May 29, 1915, 128 ft. rail	161.7
" St. Lawrence	378.8
" Merrickville, water, May 28, 1915, 128 ft. rail	322.5
" Prescott	321.4
" Merrickville, water, May 29, 1915, 128 ft. rail	288.4
" Renfrew	298.3

RAIL ELEVATIONS, OTTAWA TO RENFREW, ONT.—*Continued.*

Elevations taken in 1915

		FEET.
Grand Trunk Railway—Arnprior		298.1
" Canadian Pacific railway (diamond crossing)		299.7
" Glasgow		145.1
" Goshen		191.2
" Renfrew		421.1

## RAIL ELEVATIONS, KEMPTON TO IVANHOE, ONT.

Elevations taken in 1915

		FEET.
Canadian Pacific Railway—Kempton		332.8
" Canadian Pacific railway, Ottawa-Prentiss line (diamond crossing)		333.2
" Kemptonville creek water, June 21, 1915, 304.1, 1914		326.6
" Swan		338.1
" Burritt		366.6
" Rideau river; water, June 23, 1915, 312.2, rail		357.6
" Merriekville		355.1
" Rosedale		360.2
" Smith's Falls		426.6
" Canadian Northern railway, Toronto-Ottawa line (under crossing) rail 403.4, C.P.R. rail		429.4
" Elmsley		441.9
" Perth		439.2
" Glenora		472.6
" Radhurst		481.0
" Maberley		578.1
" Fall river; water, Aug. 17, 1915, 578.5, rail		595.6
" Sharbot Lake, main line		647.9
" Sharbot Lake, water, Oct. 21, 1915		636.8
" Olden		733.6
" Mountain Grove		683.2
" Ardendale		620.1
" Salmon river, water, Oct. 27, 1915, 613, rail		632.1
" Kennebec		667.2
" Kaladar		704.8
" Alvington		590.6
" Hangerford		557.5
" Sulphur		485.2
" Bogart		477.9
" Moon river, water, Nov. 9, 1915, 458.2, rail		475.0
" Tweed		478.2
" Canadian Northern railway, Bala-Klein branch (diamond crossing)		481.4
" Baldoon		592.6
" Grand Trunk railway, Alton place (under crossing) rail 562.1, C.P.R. rail		587.6
" Ivandoe		619.3

## RAIL ELEVATIONS, CARLETON PLACE TO BROCKVILLE, ONT.

Elevations taken in 1915

		FEET.
Canadian Pacific Railway—Carleton Place, main line		444.4
" Brockville		450.3
" Brockville		461.1
"		480.6
" Weishi		433.0

RAIL ELEVATIONS, CARLETON PLACE TO BROCKVILLE, ONT. *Concluded.*

(Elevations taken in 1915)

	FEET
Canadian Pacific Railway—Canadian Northern railway, Toronto-Ottawa line (under crossing) rail 403.4;	
C.P.R. rail	429.4
Smiths Falls	426.6
Rideau river; water, July 14, 1915, 348.6; rail	382.3
Jasper	343.4
Irish creek; water, July 15, 1915, 337.3; rail	343.8
Yule	398.5
Bell	390.0
Jelly	375.9
Bellamy	397.0
Hawkins	392.7
Clark	417.9
Fairfield	397.8

## RAIL ELEVATIONS, RENFREW TO KINGSTON, ONT.

(Elevations taken in 1915 and 1916)

	FEET
Canadian Pacific Railway—Renfrew	416.4
Grand Trunk railway, Ottawa division (diamond crossing)	402.9
Ashted	567.1
Madawaska river; water, Sept. 8, 1915, 492.8; rail	518.4
Calabogue	515.8
Madawaska river; water, Sept. 8, 1915, 499.9; rail	515.1
Barryvale	533.9
Flower	625.0
Clyde Forks	608.2
Folger	800.0
Levant	841.4
Wilbur	884.0
Snow Road	655.7
Mississippi river; water, Aug. 30, 1915, 645.7; rail	656.4
Mississippi	683.0
Clarendon	759.5
Oso	679.4
Sharbot Lake—Kingston subdivision	647.3
Sharbot lake, water, Sept. 22, 1915	637.0
Oronto	674.7
Canadian Pacific railway, main line—diamond crossing at Tichborne	650.5
Hinchbrook	560.3
Goodies	498.6
Verona	459.0
Hartington	530.5
Harroway	491.2
Mayville	478.5
Gleason	419.4
Grand Trunk railway, main line—diamond crossing	287.1
Grand Trunk railway, Kingston branch—diamond crossing	254.7
Kingston	253.7
Lake Ontario, water, Sept. 26, 1916	245.5

## RAIL ELEVATIONS, IVANHOE TO BELLEVILLE, ONT.

(Elevations taken in 1916).

	FEET
Grand Trunk Railway—Ivanhoe.....	468.7
" West Huntingdon.....	446.0
" Madoc Junction .....	503.9
" Holloway.....	423.1
" Foxboro.....	358.2
" Moira river; water, April 26, 1916, 335.0; rail.....	358.2
" Corbyville.....	332.8
" Belleville.....	285.8

## RAIL ELEVATIONS, STEELTON TO FRANZ, ONT.

(Elevations taken in 1915).

	FEET
Algoma Central Railway—Steelton.....	616.3
" Odena.....	926.1
" Granite.....	1018.4
" Root river; water, June 23, 1915, 1030.4; rail.....	1046.0
" Heyden.....	1070.7
" Gilbert.....	1076.6
" Island Lake.....	1088.8
" Bellevue.....	1140.6
" Northfield.....	1080.4
" Glendale.....	836.5
" Goulais.....	768.9
" Goulais river; water, June 30, 1915, 755.6; rail.....	778.8
" Searchmont.....	779.7
" Wabos.....	944.1
" Superior Jet.....	1104.3
" Achigan.....	1112.2
" Achigan lake; water, July 7, 1915, 1103.7; rail (on bridge).....	1112.8
" Lunan.....	1114.7
" Bueyrus.....	1151.6
" Ogadaki.....	1227.3
" South branch, Chippawa river; water, July 8, 1915, 1017.1; rail.....	1027.7
" Chippawa.....	1029.4
" Mashkode.....	1143.0
" Trout Lake; water, July 15, 1915, 1118.9; rail.....	1127.6
" Alva.....	1278.8
" Mekatina.....	1452.0
" Pangis.....	1279.8
" North branch, Chippawa river; water, July 23, 1915, 1188.2; rail.....	1237.5
" Spruce.....	1325.3
" Summit.....	1412.9
" Mongoos lake; water, July 27, 1915, 1230.9; rail (on bridge).....	1241.9
" Mongoos.....	1242.2
" Batchawana.....	1022.2
" Batchawana river; water, July 26, 1915, 1000.9; rail.....	1033.9
" Rand.....	1395.1
" Regent.....	1337.6
" Montreal river; water, Aug. 3, 1915, 1181; rail.....	1283.4
" Montreal.....	1514.3
" Frater.....	1462.0
" Little Agawa river (mileage 109.1 from Sault Ste. Marie); water, Aug. 11, 1915, 995.3; rail.....	1017.0
" Agawa river (mileage 111.5 from Sault Ste. Marie); water, Aug. 19, 1915, 911.7; rail.....	933.0

100



RAIL ELEVATIONS, KIPP, ALTA., TO GOLDEN, BA' - *Concluded.*

Elevations taken in 1914 and 1915).

Canadian Pacific Railway	Lundbreck	FEET
"	Crowsnest river, first crossing; water, Oct. 2, 1914, 3805.0; rail.	3918.3
"	Burnis	3825.3
"	Passburg	4004.5
"	Hillcrest	4044.3
"	Frank	4122.5
"	Crowsnest river, second crossing; water, Oct. 8, 1914, 4182.2; rail	4212.2
"	Blairmore	4192.7
"	Crowsnest river, third crossing; water, Oct. 9, 1914, 4266.8; rail	4235.9
"	Clemon	4277.0
"	Sentry	4312.3
"	Crowsnest	4448.5
"	Loop	4450.8
"	McGillivray	4249.3
"	Michel creek, immediately west of McGillivray; water, May 5, 1915, 4449.2; rail	4172.8
"	Michel	4169.8
"	Natal	3861.8
"	Sparwood	3782.4
"	Hosmer	3648.3
"	Fortne	3457.8
"	Coal creek, water, May 20, 1915, 3287.1; rail	3313.4
"	Cokito	3312.2
"	Morrissey	3232.8
"	Morrissey creek; water, May 24, 1915, 3099.6; rail	3139.4
"	Courier	3109.2
"	Elk river; water, May 29, 1915, 3016.1; rail.	3084.0
"	Elko	3036.9
"	Great Northern railway (overhead crossing) rail 3116.3; C.P.R. rail	3089.0
"	Canthess	3089.4
"	Galloway	2851.5
"	Jaffray	2849.1
"	Colvalli	2703.1
"	Bull River station	2660.7
"	Bull river, water, June 11, 1915, 2468.8; rail	2476.0
"	Fenwick	2479.3
"	Stock	2485.5
"	Wren	2524.0
"	Kootenay river, water, June 25, 1915, 2522.4; rail	2537.2
"	Skookmichuck creek, water, July 6, 1915, 2607.5; rail	2540.7
"	Ferrent, south-on-house	2624.7
"	Canaditit	2607.3
"	Ratnam	2666.4
"	Atledmer	2659.2
"	Columbia river, mileage 98.6 from Colvalli; water, Aug. 4, 1915	2633.3
"	Columbia river, mileage 102.6 from Colvalli; water, July 30, 1915, 2610.2; rail	2617.8
"	Columbia river, mileage 102.7 from Colvalli; water, July 30, 1915, 2609.3; rail	2617.7
"	Edgewater	2616.9
"	Hisco	2613.3
"	Spillimacheen	2601.5
"	Hatlogate	2603.6
"	Parson	2594.8
"	Moss	2588.4
"	Nicholson	2585.9
"	Kicking Horse river, water, Sept. 2, 1915, 2584.1; rail	2580.5
"	Golden	2594.1
		2583.8

## RAIL ELEVATIONS, BULL RIVER TO KOOTENAY LANDING, B.C.

Elevations taken in 1916.

	FEET
Canadian Pacific Railway—Bull River	2476.0
" Mayook	2710.1
" Rampart	2691.9
" Eager	2897.0
" Cranbrook	3019.3
" Cassiar	3262.8
" Wattsburg	3236.3
" Swansea	3195.6
" Moyie river (mileage 10.9 from Cranbrook); water, May 15, 1916, 3133.5;	
rail	3114.1
" Moyie river (mileage 13.1 from Cranbrook); water, May 15, 1916, 3042.6;	
rail	3055.3
" Pea Vine creek (mileage 13.3 from Cranbrook); water, May 15, 1916, 3042.3;	
rail	3054.2
" Jerome	3056.6
" Moyie	3051.7
" Aldridge	3057.3
" Moyie river; water, May 17, 1916, 3037.4; rail	3048.5
" Tochtly	2970.0
" Ryan	2903.8
" Yahk	2823.1
" Curzon	2815.8
" Goatfell	2909.6
" Cadorna	2441.1
" McNeillie	2130.0
" Canyon	2096.8
" Goat river; water, June 17, 1916, 1948; rail	2088.8
" Erickson	2112.7
" Creston	1988.5
" Wynndel	1856.7
" Duck Creek	1850.5
" Sirdar	1807.9
" Kootenay lake; water, June 21, 1916	1760.2

## RAIL ELEVATIONS, FIELD TO REVELSTOKE, B.C.

Elevations taken in 1915 and 1916.

	FEET
Canadian Pacific Railway—Field	1076.1
" Emerald	3890.9
" Okanogan river, mileage 6.25 from Field; water, Aug. 6, 1915, 3749.0; rail	3780.6
" Okanogan	3703.8
" Kicking Horse river, mileage 9.25 from Field; water, Aug. 14, 1915, 3691.2;	
rail	3703.8
" Leechford	3685.6
" Kicking Horse river, mileage 21.6 from Field; water, Aug. 17, 1915, 3296.5;	
rail	3300.7
" Pelly	3288.6
" Kicking Horse river, mileage 25.7 from Field; water, Aug. 24, 1915, 3120.4;	
rail	3156.6
" Columbia	3009.8

RAIL ELEVATIONS, FIELD TO REVELSTOKE, B.C.—*continued*

Elevations taken in 1915 and 1916

	FEET
Canadian Pacific Railway Kicking Horse river (mileage 31.6 from Field); water, Aug. 25, 1915, 2701.8, rail	2719.9
" Kicking Horse river (mileage 32.0 from Field); water, Aug. 25, 1915, 2683.1, rail	2702.3
" Kicking Horse river (mileage 32.75 from Field); water, Aug. 25, 1915, 2654.5, rail	2668.9
" Kicking Horse river (mileage 33.24 from Field); water, Aug. 25, 1915, 2629.0, rail	2645.4
" Golden	2583.7
" Moberly	2559.4
" Donald	2581.3
" Columbia river (mileage 52.7 from Field); water, Sept. 6, 1915, 2519.4; rail	2561.2
" Redgrave	2535.1
" Beavermouth	2434.4
" Beaver river (mileage 66.1 from Field); water, Sept. 16, 1915, 2527.4; rail	2556.9
" Anzac	2592.7
" Sturdee	3168.9
" Cutbank	3329.1
" Bear Creek	3665.7
" Rogers Pass	4306.8
" Summit of Selkirk range trail	4341.6
" Glacier	4091.1
" Cambo	3779.3
" Illecillewaet river (mileage 90.4 from Field); water, Oct. 22, 1915, 3690.7; rail	3740.7
" Illecillewaet river (mileage 90.8 from Field); water, Oct. 21, 1915, 3652.4; rail	3701.8
" Illecillewaet river (mileage 91.8 from Field); water, Oct. 21, 1915, 3572.5, rail	3584.8
" Ross Peak	3435.2
" Illecillewaet river (mileage 94.7 from Field); water, Oct. 21, 1915, 3388.2, rail	3401.4
" Illecillewaet river (mileage 95.1 from Field); water, Oct. 21, 1915, 3330.8; rail	3363.8
" Illecillewaet river (mileage 97.6 from Field); water, Oct. 15, 1915, 3095.0, rail	3106.7
" Flat Creek	3094.7
" Illecillewaet river (mileage 98.9 from Field); water, Oct. 15, 1915, 2994.1, rail	3017.7
" Illecillewaet river (mileage 102.2 from Field); water, Oct. 23, 1915, 2716.6, rail	2758.5
" Illecillewaet	2713.6
" Illecillewaet river (mileage 106.2 from Field); water, Oct. 25, 1915, 2424.7, rail	2480.1
" Albert Canyon	2227.1
" Lanetta	1962.3
" Twin Butte	1879.9
" Illecillewaet river (mileage 126.8 from Field); water, July 25, 1916, 1602.4; rail	1635.9
" Revelstoke	1496.7

## RAIL ELEVATIONS, EDMONTON TO JASPER, ALTA

Elevations taken in 1915 and 1916

	FEET
Canadian Northern Railway - Edmonton	2185.4
Grand Trunk Pacific Ry - Canadian Northern railway, main line (diamond crossing)	2229.5
" - Bissell	2235.8
" - Acheson	2339.7
" - Sprucegrove	2325.5
" - Stony plain	2323.4
" - Carvel	2460.0
" - Duffield	2382.2
" - Wabamun lake; water, Sept. 3, 1915, 2376.8; rail (on bridge)	2388.1
" - Wabamun	2384.1
" - Lallo	2395.7
" - Seba Beach	2452.3
" - Gantford	2440.0
" - Entwistle	2570.9
" - Pembina river; water, Sept. 20, 1915, 2356; rail	2562.5
" - Lurie	2580.9
" - Jenkins	2622.8
" - Keston	2621.1
" - Canadian Northern railway (diamond crossing)	2599.5
" - Leaman	2613.0
" - Mackay	2657.6
" - Naton	2737.4
" - Otley	2767.6
" - Peers	2786.3
" - Rosevear	2840.7
" - Thornton	2854.1
" - Wolf river; water, Oct. 14, 1915, 2754; rail	2879.2
" - McLeod river; water, Oct. 14, 1915, 2760; rail	2879.1
" - Yates	2892.1
" - Edison	2985.6
" - Ansel	3036.7
" - Canadian Northern railway (under crossing) rail, 3034.4; G. T. P. Ry. rail	3065.4
" - Sundance creek; water, Oct. 22, 1915, 2943.8; rail	3067.3
" - Bickerdike	3117.5
" - Dandurand	3194.5
" - Galloway	3271.7
" - Medicine Lodge	3396.5
" - Hargwen	3486.2
" - Obel	3562.6
" - Roundcroft	3467.2
" - Pedley	3471.5
" - Hinton	3326.6
" - Dyke	3288.3
" - Parkgate	3308.0
" - Fiddle creek; water, July 27, 1916, 3241.4; rail	3256.5
" - Pound on toes	3260.0
" - Rocky river; water, Aug. 1, 1916, 3282.2; rail	3296.1
" - Hayes	3287.7
" - Interlaken	3290.2
" - Athabasca river; water, Aug. 1, 1916, 3288.8; rail	3305.1
" - Hearn House	3333.8
" - Canadian Northern railway (under crossing) rail, 3320.9; G. T. P. Ry. rail	3348.8
" - Jasper	3469.7

TABLE III-A.

## RAIL ELEVATIONS, ST. STEPHEN, N.B., TO RIVIERE DU LOUP, QUE.

(Elevations taken in 1909.)

	FEET
Canadian Pacific Railway—St. Stephen	15.1
" Oak Bay	72.5
" Brunswick	279.6
" Hewitt	303.8
" Dumbarton	230.0
" Watt	312.3
" McAdam	458.6
" Canterbury	563.1
" Benton	415.6
" Debec	551.3
" International boundary (on Houlton Branch)	525.9
" Woodstock (old yard station)	148.3
" Upper Woodstock	158.7
" Hartland	169.1
" Florenceville	191.5
" Bristol	206.1
" Bath	218.0
" Kilburn	286.0
" Perth	257.8
" Andover	268.6
" Aroostook	276.0
" International boundary (on Aroostook branch)	372.9
" Grand Falls	504.8
" St. Leonard	509.4
" Green River	485.6
" Edmundston	478.9
Temiscouata Railway—Edmundston	478.4
" Ste. Rose	505.8
" Notre-Dame-du-Lac	529.9
" Cabano	563.1
" Vauban	1058.0
" St. Honoré	1302.0
" Whitworth	879.2
" Ste. Modeste	547.6
Intercolonial Railway—Rivière-du-Loup	315.6

## RAIL ELEVATIONS, BRUNSWICK TO ST. JOHN, N.B.

(Elevations taken in 1909.)

	FEET
Canadian Pacific Railway—Brunswick	279.6
" Dyer	104.1
" Bonny River	72.4
" St. George	89.4
" Utopia	112.0
" Pennfield	226.5
" Pocologan	203.8
" New River	172.5
" Lepreau	78.2
" Musquash	46.6
" Prince of Wales	118.2
" Allan Cot	208.0
" Spruce Lake	205.6
" Duck Cove	68.6
Intercolonial Railway—St. John	20.6

## RAIL ELEVATIONS, ST. JOHNS TO SHERBROOKE, QUE.

Elevations taken in 1907		FEET
Canadian Pacific Railway	Bererville	109.3
"	Bererville Junction	144.9
"	Versailles	186.5
Branch line to international boundary		180.8
"	Mystic	179.0
"	Bedford	122.0
Central Vermont Railway	St. Armand	
Main line—continued		267.7
Canadian Pacific Railway	Brookport	376.0
"	Verdunville	428.0
"	West Shiford	584.3
"	Enfield	696.4
"	Foster	
Branch line to international boundary		680.2
"	Kewawton	676.9
"	Brome	557.8
"	Langens	581.2
"	Sutton	485.7
"	Abercorn	
Main line—continued		837.0
"	South Strickely	910.2
"	Lastray	688.7
"	Magog	647.7
"	Staswate	700.5
"	Rock Forest	

## RAIL ELEVATIONS, SHERBROOKE, QUE., TO NORTON MILLS, VERMONT

Elevations taken in 1907		FEET
Grand Trunk Railway	Sherbrooke	485.1
"	Lennoxville	498.6
"	Waterville	645.0
"	Compton	733.0
"	Hillhurst	818.7
"	Concord	1006.2
"	Dixville	1126.8

## RAIL ELEVATIONS, COTEAU JUNCTION, QUE., TO COLBORNE, ONT.

Elevations taken in 1908		FEET
Grand Trunk Railway	Coteau Junction	160.1
"	St. Polycarpe	176.0
Canadian Pacific Railway	St. Polycarpe Junction	194.0
"	St. Julesphane	213.7
"	Dallouste Mills	226.5
"	Glen Norman	253.0
"	Green Valley	281.5
"	Apple Hill	301.5

## RAIL ELEVATIONS, COTEAU JUNCTION, QUE. TO COLLEGE ST. ONT. CAN.

Elevations taken in 1908.

Canadian Pacific Railway—Monkland	327.5
" Avonmore	327.5
" Ottawa & New York railway, diamond crossing at Finet	271.9
" Chesterville	240.1
" Winchester	240.9
" Inkerman	267.1
" Mountain	272.5
" Kempton	332.8
" Canadian Pacific railway, Ottawa-Prescott line (diamond crossing)	333.2
" Oxford	354.5
" Spencerville	348.5
Grand Trunk Railway—Prescott	310.9
" Matland	329.7
" Brockville	282.6
" Lyn	287.4
" Yonge Mills	301.9
" Lansdowne	336.6
" Gananoque Junction	345.6
" Findley	367.7
" Rideau	305.2
" Kingston Junction	271.8
" Canadian Pacific railway, Kingston-Renfrew line (diamond crossing)	287.3
" Collins Bay	284.1
" Ernestown	325.0
" Fredericksburg	308.2
" Napanee	314.3
" Canadian Northern railway, Toronto-Ottawa line (diamond crossing)	326.5
" Marysville	335.8
" Shannonville	334.8
" Belleville	286.0
" Trenton	285.3
" Brighton	303.7
" Colborne	321.8

## INDEX.

ALPHABETICAL LIST OF CITIES, TOWNS AND VILLAGES AT OR NEAR WHICH BENCH-MARKS  
HAVE BEEN ESTABLISHED

Note.—"Year of Publication" refers to the "Publications of the Dominion Observatory" as follows:

1913*	Vol. I, No. 2	1915	Vol. II, No. 1
1913	Vol. I, No. 3	1916	Vol. III, No. 6
1914	Vol. I, No. 8	1917	this publication.

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			Page	Page
Abercorn, Que.	51	1917	282	318
Adamsville, Que.	59	1917	281	317
Ailsa Craig, Ont.	44	1914	220	256
Alameda, Sask.	57 C	1913	69	83
Albert, Oregon, B.C.	363 C	1917	270	310
Alcove, Que.	472	1914	218	234
Aldergrove, B.C.	24, 1	1916	170	191
Algoma, Ont.	602	1916	156	181
Alx, Alta.	61, 1, 62, 1	1916	165	187
Allenford, Ont.	292	1913	60	83
Alison, Ont.	382, 384	1913	63	86
Almonte, Ont.	64 C, 65 C, 66 C	1917	250	296
Anderson, N.S.	45, 46, 548, B	1916	146	173
Andover, N.B.	40, B	1917	277	314
Armagh, N.S.	172, 43, 173, E	1916	47	74
Arphar, N.B.	116, B	1916	44	76
Arpa, Ont.	240	1917	56	81
Arpa, H.P. Co.	180	1917	285	320
Arrowsmith, Alta.	5, H	1916	163	186
Argyle, N.S.	457, B	1916	46	70
Arnprior, Ont.	70 C, 71 C, 72 C	1917	250	293
Arrowsmith, N.B.	41, B	1917	277	314
Arundel, Sask.	98, H	1916	20	34
Asquith, Sask.	1, H	1916	19	33
Atchafalaya, B.C.	113, D	1916	266	306
Atchafalaya, Ont.	309	1916	61	85
Avalon, N.S.	187, E	1916	118	170
Avalon, N.S.	10, B	1917	37	74
Avalon, Ont.	106	1917	285	320
Avers, Ont.	28, A, 2, 20	1916	48	75
Avalon, Sask.	11, D	1916	72	90
Azilda, Ont.	477	1914	225	248



ALPHABETICAL LIST OF CITIES, TOWNS AND VILLAGES AT OR NEAR WHICH BENCH-MARKS  
HAVE BEEN ESTABLISHED *(Continued)*

Place	B.M. Number	Year of Publication	Description	Elevation
			Page	Page
Baker Brook, N.B.	264-B	1917	247	260
Bala, Ont.	408	1913	66	86
Baillif, Alta.	240-C, 241-C	1916	167	188
Barons, Alta.	76-D, 77-D	1915	25	8
Barrington, N.S.	414-B	1915	12	29
Barrington Passage, N.S.	446-B	1915	12	29
Barrys Bay, Ont.	523	1915	16	32
Bashaw, Alta.	65-I	1916	165	187
Bath, N.B.	35-B	1917	276	311
Baxfield, N.S.	177-B	1913	48	75
Beamsville, Ont.	204	1913	63	86
Beaudette, Minn.	16-I	1914	226	239
Beaumont, B.C.	284-C	1917	269	309
Bedford, Que.	66	1917	282	318
Bedford, N.S.	506-B	1916	144	171
Beecher Falls, Vt.	562-B	1916	156	180
Beeton, Ont.	379	1913	64	86
Beiseker, Alta.	48-I	1916	161	187
Belgrave, Ont.	316	1913	61	83
Belle River, Ont.	252	1913	57	81
Belleville, N.S.	459-B	1915	13	39
Belleville, Ont.	156-C, 157-A, 2	1917	288	322
Bennett, B.C.	32-R	1913*	23	23
Benton, N.B.	48-B	1917	276	313
Berwick, N.S.	488-B	1916	148	175
Bethune, Sask.	9-D	1913	71	90
Bienfait, Sask.	61-C	1913	69	88
Biggar, Sask.	12-H	1915	20	34
Blackie, Alta.	65-D	1915	26	38
Blackworth, Sask.	19-D	1914	227	240
Blaine, Wash.	19-I	1916	169	199
Blairmore, Alta.	103-D	1917	262	304
Blind River, Ont.	604, 605	1916	136	181
Bloomfield, N.B.	111-B	1915	11	73
Bluevale, Ont.	315	1913	64	84
Blyth, Ont.	317	1913	61	8
Boharm, Sask.	106	1914	39	41
Bonestown, N.B.	33-C	1916	131	178
Bonsevan, Man.	31-C, 32-C	1916	67	86
Bolton, Ont.	260	1913	38	82, 89
Bothwell, Ont.	243	1913	67	81
Boundary Creek, N.B.	128-B	1915	16	73
Bow Island, Alta.	178-C, 179-C	1915	36	39
Bowmanville, Ont.	175	1913	64	79
Braceburn, Y.T.	37	1913*	27	33
Brant, Alta.	65-D	1915	26	38
Brantford, Ont.	219, 220	1913	66	80

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Place	ICM Number	Year of Publication	Description	Elevation
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Brimleyville, N.S.	409 B + 411 B	1915	10	28
Brimley Falls, N.S.	170 B	1915	47	74
Brimley, Ont.	165	1915	288	322
Brimley, N.B.	34 B	1915	276	314
Brookville, Ont.	125, 126	1915	286	321
Brown, Que.	565, 406 C	1915	252	298
Brown, Que.	50	1915	282	318
Brookville, Que.	400	1915	281	317
Brown, Ont.	15 B	1916	162	186
Brown, Mass., Ont.	649	1916	156	182
Brown, Ont.	29	1916	62	84
Brown, N.B.	6 B	1917	275	313
Brown, Ont.	32	1917	61	83
Bentley, B.C.	150 D	1917	264	305
Bentley, Ont.	180 C + 181 C	1917	25	35
Bentley, Ont.	196	1917	55	80
Berry, Que.	15 A 2	1918	49	76
C				
Caldwell, Ont.	139 C	1917	254	299
Caldwell, Mass.	1 B	1917	275	313
Caldwell, Ont.	312	1917	16	32
Caldwell, Ont.	265	1917	58	82
Caldwell, Ont.	30 D + 31 D + 32 D	1917	27	39
Caldwell, Ont.	33 F	1917	165	187
Caldwell, Ont.	37 C + 38 C	1917	166	188
Caldwell, Ont.	390 F	1916	138	175
Caldwell, N.S.	300, 301 C	1916	131	177
Caldwell, N.B.	300, 301 C	1916	165	187
Caldwell, Ont.	300, 301 C	1916	167	188
Caldwell, N.B.	301 B	1917	59	83
Caldwell, Ont.	30	1917	48	75
Caldwell, Ont.	301 F	1917	45	291
Caldwell, Ont.	300, 301	1917	23	24
Caldwell, Ont.	130 C	1917	68	88
Caldwell, Ont.	300, 301 C + 302 C	1917	219	300
Caldwell, Ont.	301 D + 31 D	1917	2	68
Caldwell, Ont.	300	1917	68	86
Caldwell, Ont.	300	1914	196	241
Caldwell, Ont.	300	1917	66	87
Caldwell, Ont.	300	1914	148	231
Caldwell, Ont.	301 D	1917	6	90
Caldwell, Ont.	300	1917	27	38
Caldwell, Ont.	300	1914	229	241

ALPHABETICAL LIST OF CITIES, TOWNS AND VILLAGES AT OR NEAR WHICH BENCH-MARKS  
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"	373, 247	1914	222	236
Nathan, N.B.	49, G	1916	152	178
Chatsworth, Ont.	283	1913	59	82
Cherry, Ala.	30, H	1915	21	34
Chelsen, Que.	464	1914	218	234
Chesley, Ont.	295, 296	1913	60	83
Chester, N.S.	101, B	1915	10	28
Chesterville, Ont.	107	1917	285	320
Chin, Alta.	191, C	1915	23	36
Chapman, N.B.	452, B	1914	216	233
Clarkson, Ont.	192	1913	55	80
Clarksville, N.S.	520, B, 521, B	1916	145	171
Clinton, Ont.	320, 321	1913	62	83
Cloverdale, B.C.	20, J, 21, J	1916	169	191
Conitcook, Que.	14, 15, 16	1917	283	319
Coblenz, Sask.	17, H	1915	20	34
Cobourg, Ont.	171	1913	53	79
Cochrane, Alta.	222, C, 25, C	1916	166	188
Colborne, Ont.	166	1917	288	322
Coldbrook, N.S.	491, B	1916	148	175
Coldwater, Ont.	399, A	1913	65	86
Collins Bay, Ont.	144	1917	287	321
Compton, Que.	10	1917	283	319
Coudre, Sask.	5, D	1915	71	90
Conn Mills, N.S.	139, B	1913	16	74
Cookshire, Que.	10, A, 3, 11, A	1913	49	76
Copetown, Ont.	216, A	1913	36	80
Corbetton, Ont.	273	1915	59	82
Corbyville, Ont.	185, C	1917	257	301
Cornwall, Ont.	489, 490, 491	1914	219	235
Cordoba, Ont.	361	1914	224	246
Coteau-du-Lac, Que.	90	1917	284	320
Courtright, Ont.	463	1914	222	246
Coutts, Alta.	216, C	1915	25	47
Cowley, Alta.	97, D	1917	262	304
Croughurst, Ont.	392	1913	65	86
Craig, Sask.	16, D	1913	72	90
Crandbrook, B.C.	172, D to 174, D	1917	266	307
Croston, B.C.	190, D, 196, D	1917	268	307
Crowsnest, B.C.	109, D	1917	263	304
Crysler, Ont.	496	1914	229	245
Crysler City, Man.	16, C	1915	67	87

\* Also B.M. in International Boundary Monument.

ALPHABETICAL LIST OF CITIES, TOWNS AND VILLAGES AT OR NEAR WHICH BENCH-MARKS  
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	D			
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Dauntless, Alta	171 C	1915	22	35
Davidson, Sask	18 D	1914	227	240
Dawson, Y.T.	223, 224	1913*	34	34
Dean Lake, Ont	609	1916	156	182
Debec, N.B.	20 B	1917	276	313
Delburne, Alta	59 F	1916	165	187
Delors ne, Man	36 C	1913	68	88
Dentfield, Ont	338	1913	62	84
Denmark, N.S.	149 B	1913	46	74
Depot Harbour, Ont	566, 567	1915	13	31
Derby Jet., N.B.	47-G-2	1916	152	178
Desbarats, Ont	622	1916	157	182
Devlin, Ont	27 L	1914	226	239
Dinant, Alta	73 F	1916	165	187
Disley, Sask	8 D	1913	71	90
Doaktown, N.B.	37 G	1916	151	178
Dobbinton, Ont	294	1913	60	83
Dorchester, N.B.	DCCCCLXXXIX, etc	1916	1	174
Dorence, Alta	66 F	1916	165	187
Dresden, Ont	370	1914	222	236
Drinkwater, Sask	91 C	1913	70	89
Duck Lake, Sask	42 D	1914	228	240
Dundalk, Ont	274	1913	59	82
Dundas, Ont	215	1913	55	80
Dundurn, Sask	25 D	1914	227	240
Dunmore, Alta	165 C	1915	22	35
	E			
Eady, Ont	398	1913	65	80
Eastman, Que	44	1917	281	317
East Pubnico, N.S.	153 B	1915	13	29
Eggsby, Que	44	1917	281	317
Eastwood, Ont	225	1913	55	80
Echo Bay, Ont	626	1916	157	182
Eden, Ont	33 H	1915	21	34
Edmonton, Alta	58 H to 61 H	1916	163	186
Edmonton, N.B.	58 B, 59 C, 60 B	1917	278	314
Edson, Alta	81 H, 82 H	1917	272	311
Eganville, Ont	514	1915	16	32
Ekersby, Ont	626	1916	157	182
Elmwood, Ont	297	1913	60	83
Elton, Man	111	1913	68	88

(Refer to Public Works Dept)

ALPHABETICAL LIST OF CITIES, TOWNS AND VILLAGES AT OR NEAR WHICH BENCH-MARKS  
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Emerson, Man.	50 C	1913	66	87
Enno, Ont.	23 F, 24 F.	1914	226	239
Enlangua, Que.	51	1917	282	318
Ensign, Alta.	65 D	1915	26	38
Ernestown, Ont.	146	1917	287	321
Ernfold, Sask.	115 C	1914	229	241
Estevan, Sask.	62 C, 63 C	1913	69	88
Eureka, Y.T.	187	1913*	32	33
Exeter, Ont.	332, 333	1913	62	84
F				
Fairville, N.B.	96 B	1917	280	316
Farnham, Que.	62	1917	281	317
"	63, 64	1917	282	318
Fernand, Alta.	67 F	1916	165	187
Fernie, B.C.	121 D to 123 D	1917	263	305
Field, B.C.	260 C	1916	168	189
Finch, Ont.	105	1917	285	320
"	495	1914	219	235
Findlater, Sask.	11 D	1913	72	90
Flesherton, Ont.	277	1913	59	82
Forest, Ont.	351	1914	221	236
Fort Erie, Ont.	215 A	1913	64	85
Fort Frances, Ont.	29 E, 30 F.	1914	226	239
Fort William, Ont.	90 E to 92 E.	1916	161	184
Foster, Que.	47	1917	281	317
Frank, Alta.	102 C	1917	262	304
Franz, Ont.	708	1917	261	303
French Village, N.S.	393 B	1915	9	28
Frobisher, Sask.	58 C	1913	69	88
Fulford, Que.	56	1917	281	317
G				
Gainsborough, Sask.	47 C	1913	68	88
Gaiyau, Sask.	47 D	1913	72	90
Gladet, B.C.	294 C	1917	270	309
Gladet, Y.T.	266	1913*	36	36
Glendon, Ont.	241, 241 A	1913	56	81
Glen Ewen, Sask.	52 C	1913	68	88
Glentay, Ont.	147 G	1917	253	295
Goderich, Ont.	325, 326, 327	1913	62	83, 84
Grafton, Ont.	156 G	1917	255	300
Golden, B.C.	273 C	1917	269	309

ALPHABETICAL LIST OF CITIES, TOWNS AND VILLAGES AT OR NEAR WHICH BENCH-MARKS  
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Gracefield, Que.	484	1914	219	234
Graceton, Minn.	14 E	1914	226	239
Grafton, Ont.	168	1913	53	79
Grainger, Alta.	50 E	1916	164	187
Grand Coulée, Sask.	101 C	1913	71	89
Grand Falls, N.B.	46 B	1917	277	314
Grand Ligne, Que.	78	1917	280	317
Grand Pré, N.S.	498 B	1916	149	175
Grandora, Sask.	3 H	1915	19	34
Grasey Lake, Alta.	182 C, 183 C	1915	23	36
Green River, N.B.	54 B	1917	277	314
Green Valley, Ont.	97	1917	285	320
Gretna, Man.	1 C	1913	66	87
Grimsby, Ont.	203	1913	63	85
Gull Lake, Sask.	136 C	1914	230	241
H				
Hague, Sask.	38 D	1914	228	240
Halbrite, Sask....	73 C	1913	69	89
Halifax, N.S.	386-B, 387 B	1915	9	28
"	386-B, 387-B	1916	144	171
"	2-C	1913	66	87
Hallock, Minn.	198, 199, 200	1913	63	85
Hamilton, Ont.	109-B	1913	44	73
Hampton, N.B.	23-D	1914	227	240
Hanley, Sask....	268, 269	1913	60	83
Hanover, Ont.	219 B	1913	52	77
Harlaka Jet., Que.	303, 304	1913	61	83
Harnston, Ont.	154 C	1917	255	300
Harrowsmith, Ont.	31 B	1917	276	313
Hartland, N.B.	151 C	1915	21	35
Hatton, Sask.	34 H	1915	21	34
Heath, Alta.	310	1913	61	83
Hendry, Ont.	118 C	1914	230	241
Herbert, Sask.	15	1917	283	319
Hillhurst, Que.	46 H	1916	163	186
Holden, Alta.	281	1913	59	82
Holland Centre, Ont.	322	1913	62	83
Holmesville, Ont.	22 C	1913	67	87
Holmfield, Man.	87	1917	284	320
Howick Jet., Que.	397 B	1915	9	28
Hubbards, N.S.	459, 460	1914	217	234
Hull, Que.	100	1913	31	31
Humes, Y.T.	26 J, 27 J	1916	170	191
Huntington, B.C.	341	1913	63	84
Hyde Park Jet., Ont.				

ALPHABETICAL LIST OF CITIES, TOWNS AND VILLAGES AT OR NEAR WHICH BENCH-MARKS  
HAVE BEEN ESTABLISHED.—*Continued*

Place	B.M. Number.	Year of Publication	Description.	Elevation
I				
Iberville, Que.	74	1917	280	317
Iderton, Ont.	339	1913	65	84
Indian River, Y.T.	205	1913*	33	33
Ingersoll, Ont.	229, 230	1913	56	80
Inkerman, Ont.	110	1917	285	320
Irma, Alta.	39 H	1916	162	185
Irvine, Alta.	159 C, 160 C	1915	22	35
Ivanhoe, Ont.	179 G	1917	257	296
J				
Jaffray, B.C.	131 D, 132 D	1917	264	305
James River, N.S.	169 B	1913	47	74
Jasper, Alta.	104 H	1917	274	312
Jasper, Ont.	97 G	1917	252	298
Jeannette, Ont.	219 A	1913	57	81
Jordan, Ont.	205	1913	63	85
Jumata, Sask.	6 H	1915	19	34
K				
Kakabeka Falls, Ont.	85 L	1916	161	184
Kazabazua, Que.	479	1914	218	234
Kearney, Ont.	552	1915	14	31
Keewatin, Ont.	34 F	1915	19	33
Kempton, Ont.	113	1917	286	320
Kemptville, Ont.	113 A	1913	52	78
Kenaston, Sask.	21 D	1914	227	240
Kennetenok, N.S.	523 B, 524 B	1916	145	171
Kenora, Ont.	36 F, 37 F, 38 F	1915	49	33
Kentville, N.S.	192 B to 194 B	1916	148	175
Kilburn, N.B.	37 B	1917	277	314
Killaloe, Ont.	518, 519	1915	16	32
Killarney, Man.	25 C	1913	67	87
Kingston, N.S.	486 B	1916	148	175
Kingston, Ont.	139, 141, 141 A, 142	1917	287	321
Kipp, Alta.	81 D	1915	25	38
Kippen, Ont.	330	1914	62	84
Kirkcaldy, Alta.	70 D	1915	26	38
Kirk Ferry, Que.	465, 466	1914	218	234
Kleinburg, Ont.	258	1913	58	82
Knowlton, Que.	49	1917	282	318
Komoka, Ont.	237 A	1914	56	80
Kootenay Landing, B.C.	204 D, 205 D	1917	268	308

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Lake Louise, Alta.	218 C, 219 C	1916	167	189
Landis, Sask.	16 H	1915	20	44
Lansdowne, Ont.	130, 131	1917	286	321
Leckford, Sask.	41 D	1914	228	240
Lenex, Sask.	S II	1915	49	34
Lennoxville, Que.	6	1917	283	319
Lepreau, N.B.	89 B	1917	279	316
Lethbridge, Alta.	196 C, 200 C	1915	24	36
" "	83 D	1915	25	38
Levis, Que.	221 B, 222 B	1913	52	77
" "	222 B	1916	153	179
L'Islet, Que.	568 B	1917	248	291
Listowel, Ont.	307, 308	1913	61	83
Little River, Y.T.	34	1913	26	26
Liverpool, N.S.	418 B, 419 B, 420 B	1915	11	29
Loudesborough, Ont.	318	1913	61	83
London, Ont.	255, 256	1913	56	80
Londonderry, N.S.	CMLXXIX	1916	4	172
Longwood, Ont.	239 A	1913	56	81
Lonsana, Alta.	58 F	1916	165	187
Low, Que.	176	1914	218	234
Lower Argyle, N.S.	455 B	1915	13	30
Lower East Pubnico, N.S.	452 B	1915	12	29
Lucan Crossing, Ont.	347	1913	62	84
Lumsden, Sask.	7 D	1913	71	90
Lyn, Ont.	125	1917	286	321
Lynden, Ont.	247	1913	55	80
Lyons Brook, N.S.	156 B	1913	47	74
<b>M</b>				
Maccan, N.S.	CMLXVI	1916	4	173
Macleod, Alta.	87 D, 88 D	1917	262	304
Macoun, Sask.	69 C	1913	69	89
Macdowall, Ont.	530, 531	1915	15	32
Madoc, Ont.	182 C	1917	257	301
Magog, Que.	40, 41, 41 A	1917	281	317
Manitowish, Ont.	121	1917	286	320
Madagash, N.S.	144 B	1915	46	74
Mallorytown, Ont.	128	1917	286	321
Manitou, Man.	44 C, 42 C	1913	66	87
Maple Creek, Sask.	145 C, 146 C	1914	291	244
Markdale, Ont.	279	1913	59	82

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McAdam, N.B.	11 B	1917	275	313
McGivney Jet., N.B.	333 B	1914	215	233
Meadowville, N.S.	153 B	1913	46	74
Medicine Hat, Alta.	167-C, 168-C, 169-C	1915	22	35
Medora, Man	40 C	1913	68	88
Medway, N.S.	415 B	1915	10	28
Megantic, Que	21 A 2, 22 A	1913	50	76
Melancthon, Ont	271 A, 272	1913	59	82
Melita, Man	42 C, 43 C	1913	68	88
Memramcook, N.B.	549 B	1916	146	174
Merigomish, N.S.	164 B	1913	47	74
Merrickville, Ont	84 G	1917	251	295
Merritton, Ont	209	1913	63	85
Mehel, B.C.	114 D	1917	263	304
Michipicoten, Ont	698	1917	261	303
Midale, Sask	71 C	1913	60	89
Middleton, N.S.	482 B, 483-B	1916	148	175
Midhurst, Ont	390	1913	65	86
Midnapore, Alta	54 D	1915	27	39
Milan, Que	18 A 2	1913	50	76
Milestone, Sask	85 C	1913	70	89
Milk River, Alta	213 C, 214 C	1915	25	37
Millerton, N.B.	47 G	1916	152	178
Mine Centre, Ont	42 E	1916	158	183
Minto, Y.T.	106	1913*	30	30
Mirror, Alta	63 F	1916	165	187
Molson, Man	40 F	1915	17	33
Monarch, Alta	84 D	1917	261	304
Monekland, Ont	102	1917	285	320
Moncton, N.B.	132-B, 133-B, 134-B	1913	45	73
"	373-B, 374-B, 132-B	1914	217	233
"	132 B	1916	146	174
Monk, Que	385 B	1917	245	289
Montague, Y.T.	69	1913*	28	28
Mont Carmel, Que	28 G	1917	248	292
Montmagny, Que	566 B	1917	247	291
Mooretown, Ont	362	1914	221	236
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"	103 C	1914	229	241
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Morne, Sask	116 C, 117-C	1914	229	241
Mortlach, Sask	110 C	1914	229	241
Mountain, Ont	111	1917	286	320
Moyie, B.C.	181 D	1917	267	307

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Narn, Ont.	579, 580	1916	154	181
Napadogan, N.B.	323-B, 324-B	1914	215	232
Napanee, Ont.	149 to 150 A-2	1917	287	321
Napinka, Man.	41 C	1913	68	88
Nappan, N.S.	CMXIX	1916	1	173
Narwigewauk, N.B.	107 B	1913	44	73
Nelson Jet., N.B.	47-G-2	1916	152	178
Newbury, Ont.	242	1913	56	81
Newcastle, Ont.	176	1913	53	79
New Dayton, Alta.	206-C, 207-C	1917	24	36
New Germany, N.S.	469-B-2	1916	147	175
New Glasgow, N.S.	160 B	1913	47	74
New Norway, Alta.	68 F	1916	165	187
New Westminster, B.C.	9 J to 13 J	1916	169	190
Nictaux, N.S.	180 B	1916	148	175
Ninga, Man.	29-C	1913	67	87
Nobleford, Alta.	79 D	1915	25	48
Nordenskiöld, Y.T.	47	1913	27	27
Northfield, Ont.	194	1914	219	235
North Lake, Ont.	106 I	1916	162	185
North Portal, Sask.	1	1913	88	88
Northwood, Ont.	245	1913	57	81
Norton, N.B.	113 B	1913	41	73
Norton Mills, Vermont	23, 24, 25	1917	284	349
Notre-Dame-du-Lac, Que.	64 B	1917	278	314
O				
Oak Bay, N.B.	4 B	1917	275	313
Oakville, Ont.	193	1913	55	80
Ohau, Sask.	44 H	1915	20	34
Okechuk, Alta.	60 D	1915	26	38
Orangeville, Ont.	267	1913	58	82
Osborne, Ont.	117 A, 118 A	1913	52	78
Oshawa, Ont.	178 A, 179, 179 A	1913	51	79

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" ".....	503, 504, 124-A	1914	220	235
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Oxbow, Sask.....	55-C	1913	69	88
Oxford, Ont.....	114	1917	286	320
Oxford, N.S.....	136-B	1913	46	74
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" ".....	135-B	1916	146	173
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Palgrave, Ont.....	376	1913	64	86
Palmerston, Ont.....	305	1913	61	83
Paquette, Que.....	557-B	1916	153	180
Paris, Ont.....	222	1913	55	80
Parkbeg, Sask.....	111-C	1914	229	241
Park Head Jet., C.....	291	1913	60	83
Parkhill, Ont.....	346	1914	221	236
Parry Sound, Ont.....	419, 420	1914	223	237
Pasqua, Sask.....	93-C	1913	71	89
Pelly, Y.T.....	118, 119	1913*	30	30
Pense, Sask.....	99-C	1913	71	89
Perth, Ont.....	112-G to 115-G	1917	253	295
Perth, N.B.....	39-B	1917	277	314
Petitcodiac, N.B.....	123-B	1913	45	73
Piapot, Sask.....	141-C	1914	231	241
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Piedmont, N.S.....	165-B	1913	47	74
Pierson, Man.....	46-C	1913	68	88
Pike Creek, Ont.....	253	1913	57	81
Pilot Mound, Man.....	15-C	1913	67	87
Pincher, Alta.....	94-D	1917	262	304
Pinewood, Ont.....	20-E	1914	226	239
Pinto, Sask.....	67-C	1913	69	88
Plaster Rock, N.B.....	301-B, 302-B	1914	213	232
Pomquet, N.S.....	176-B	1913	58	74
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Port Clyde, N.S.....	442-B	1915	12	29
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Port Robinson, Ont.....	212	1913	63	85
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Pubnico, N.S.	454-B	1915	13	30
Q.				
Quarryville, N.B.	45-G	1916	152	178
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Rainy River, Ont.	17-E	1914	226	239
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Regina, Sask.	1-D, 2-D, 3-D	1913	71	90
Renfrew, Ont.	505, 506, 507	1915	17	32
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Revelstoke, B.C.	311-C to 314-C	1917	271	310
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Rivière-du-Loup, Que.	76-B, 77-B, 78-B	1917	279	315
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Roche-Percée, Sask.	65-C	1913	69	88
Rock Island, Que.	33-A	1913	49	75
Roosevelt, Minn., U.S.	13-E	1914	226	239
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Rosthern, Sask.	40-D	1914	228	240
Rothsay, N.B.	103-B, 104-B	1913	44	73
Rouleau, Sask.	88-C, 89-C	1913	70	89
Rush Lake, Sask.	120-C	1914	230	241
Russell, Ont.	439	1914	220	235
Ryley, Alta.	17-H, 48-H	1916	163	186
S.				
Sable River, N.S.	427-B	1915	11	29
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Sault Ste. Marie, Mich.	636	1916	157	182
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Scotia Jet., Ont.	553	1915	14	31

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Shannonville, Ont.	154	1917	288	321
Sharbot Lake, Ont.	124-G	1917	253	295
Shelburne, N.S.	433-B to 436-B	1915	11, 12	29
Shelburne, Ont.	271	1913	59	82
Sherbrooke, Que.	1, 2, 3	1917	283	319
"	35, 36	1917	281	317
Siegas, N.B.	51-B	1917	277	314
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	107-G, 108-G	1917	251 to 253	295
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Spillimacheen, B.C.	159-D	1917	265	306
Sprague, Man.	10-E	1914	225	239
Springfield, N.S.	472-B	1916	147	175
Springhill, Que.	19-A-2, 20-A	1913	50	76
Springhill Jet., N.S.	CMX	1916	†	173
Sprucedale, Ont.	556	1915	14	31
Sprucegrove, Alta.	64-H	1917	271	311
Stanbridge, Que.	67	1917	282	318
Stanley, Ont.	86-E	1916	161	184
Stanstead, Que.	34	1913	49	75
Steele, B.C.	138-D	1917	264	305
Steelton, Ont.	634, 635	1916	157	182
Stephen, Minnesota	1-C	1913	66	87
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Stirling, Alta.	203-C, 204-C	1915	24	36
Stittville, Ont.	55-G	1917	249	293
Stoney Creek, Ont.	201	1913	63	85
Stoney Point, Ont.	250	1913	57	84
Stonyplain, Alta.	65-H	1917	271	311
Stottsville, Que.	79	1917	280	317
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U.				
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Valleyfield, Que. ....	89	1917	284	320
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Weston, Ont.	256-A	1913	58	82
Weyburn, Sask.	80-C, 81-C	1913	70	89
Whitby, Ont.	180-A	1913	54	79
Whitchose, Y.T.	1	1913*	25	25
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White Pass, B.C.	42-R, 43-R	1913*	23	23
White Rock, B.C.	17-J, 18-J	1916	169	190
Whitewater, Man.	35-C	1915	68	88
Whitsey, Ont.	536	1915	15	31
Wilton, Sask.	86-C, 87-C	1913	70	89
Wilnot, N.S.	185-B	1916	148	175
Winchester, Ont.	109	1917	285	320
Windsor, Ont.	255	1913	57	81
Windsor, N.S.	502-B to 505-B	1916	119	176
Windsor Jet., N.S.	MXXXIV	1916	‡	171
Wingham, Ont.	314	1913	61	83
Winnifred, Alta.	176-C	1915	23	35
Winnipeg, Man.	1-E, 2-F, 3-F	1915	17	33
Winnipeg, Ont.	202	1913	63	85
Winter, Sask.	25-H	1915	20	34
Worcester, N.S.	195-B to 197-B	1916	148, 149	175
Woodstock, Ont.	226, 227	1913	55	80
Woodstock, N.B.	25-B, 26-B, 27-B	1917	276	313
Woodington, Ont.	577	1916	151	181
Wounded Knee, Y.T.	179	1913*	33	33
	A			
Yale, B.C.	187-D	1917	267	307
Yarmouth, N.S.	163-B, 164-B, 165-B	1915	13	30
Yellow Grass, Sask.	83-C	1913	70	89
Yukon Crossing, Y.T.	91	1913*	29	29
	Z			
Zandvoort, Sask.	27-H	1915	20	34

(Refer to Public Works Dept.)

Dominion Observatory

Ottawa

February, 1917



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Gulf of Boothia  
Fury and Hecla Str.

Compton Bay

Fox Channel

Baffin Island  
Amadjuak Lake

Chumberland Sound

Frobisher Bay

Resolution I.

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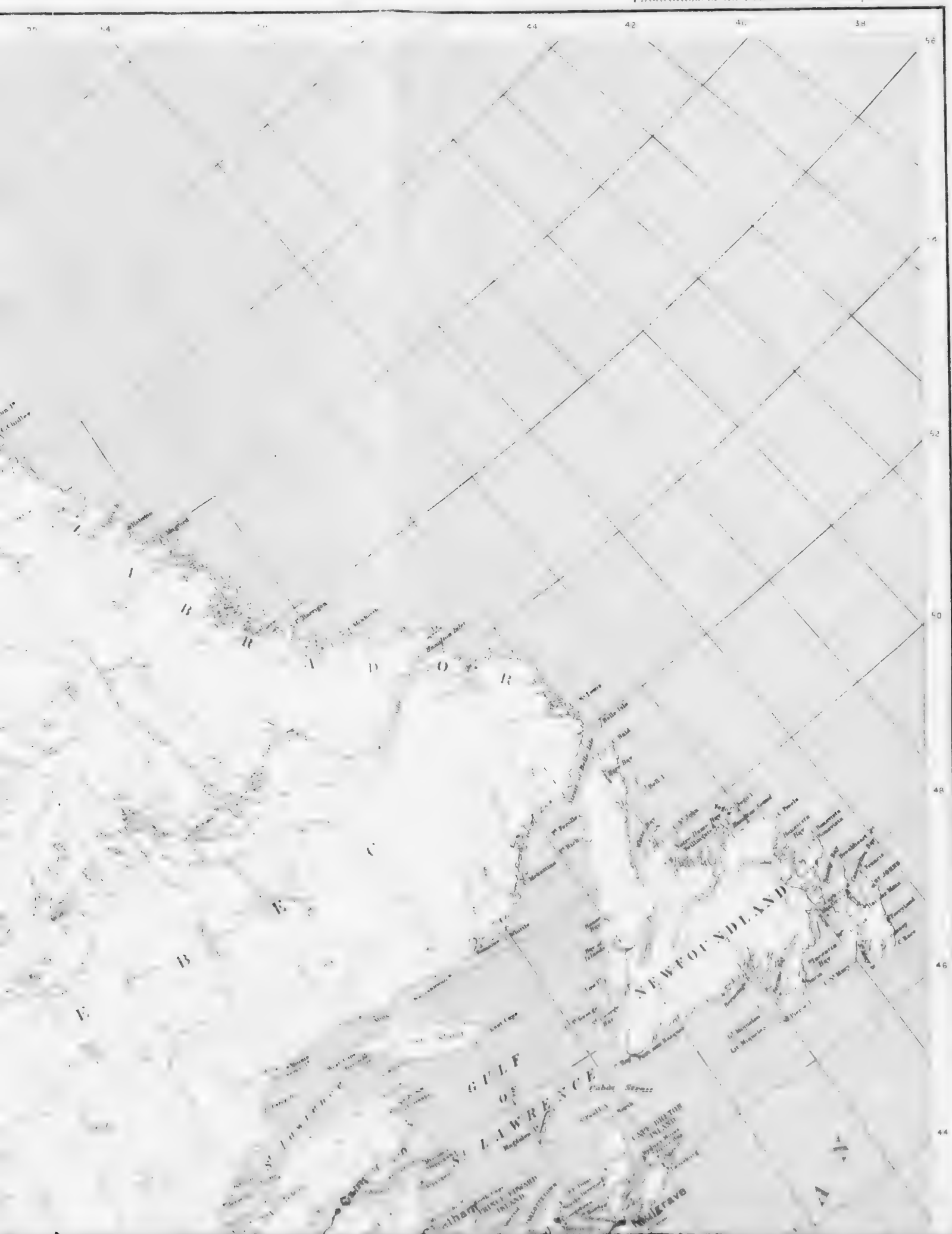
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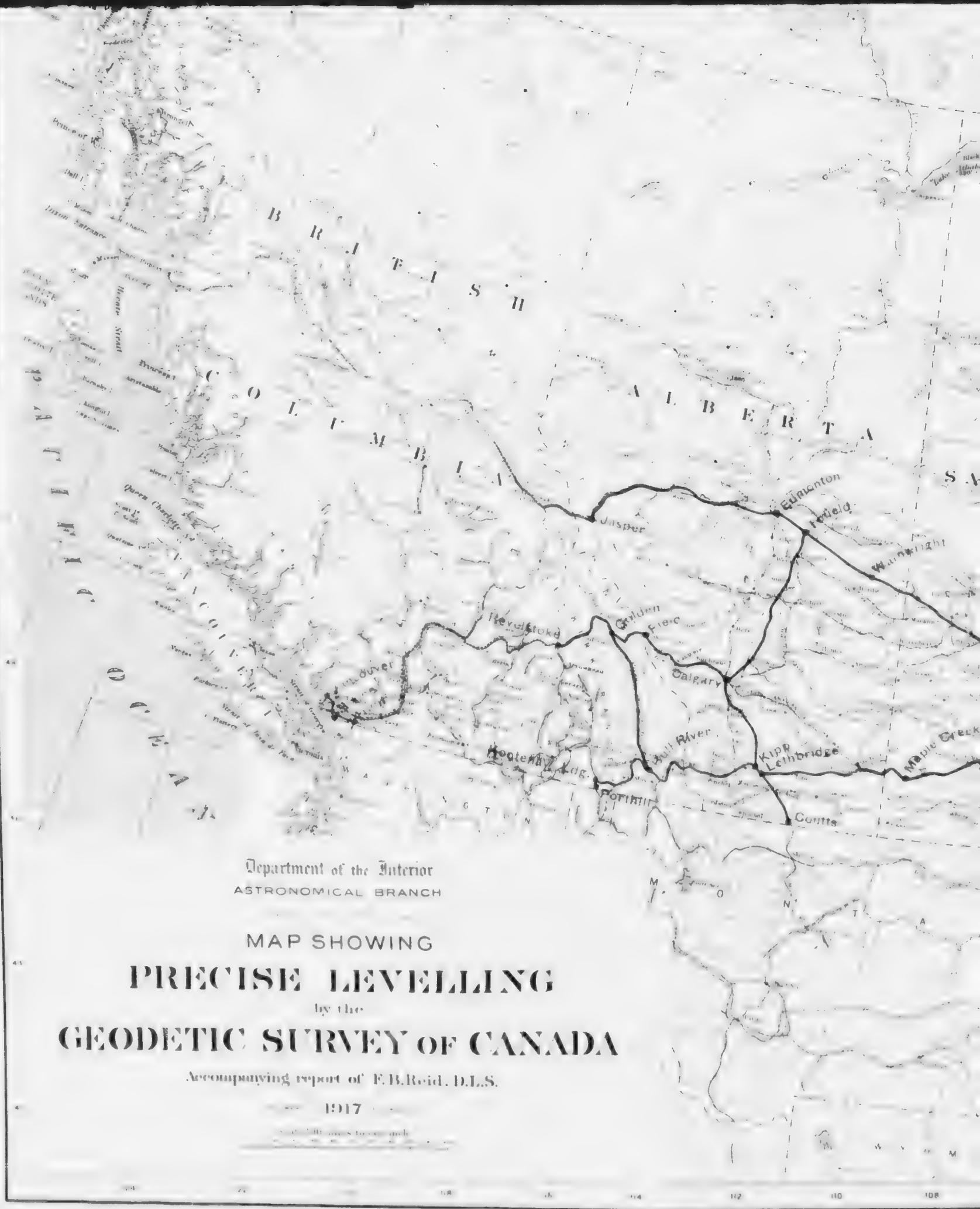
Ungava Bay

HUDSON BAY

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Department of the Interior  
ASTRONOMICAL BRANCH

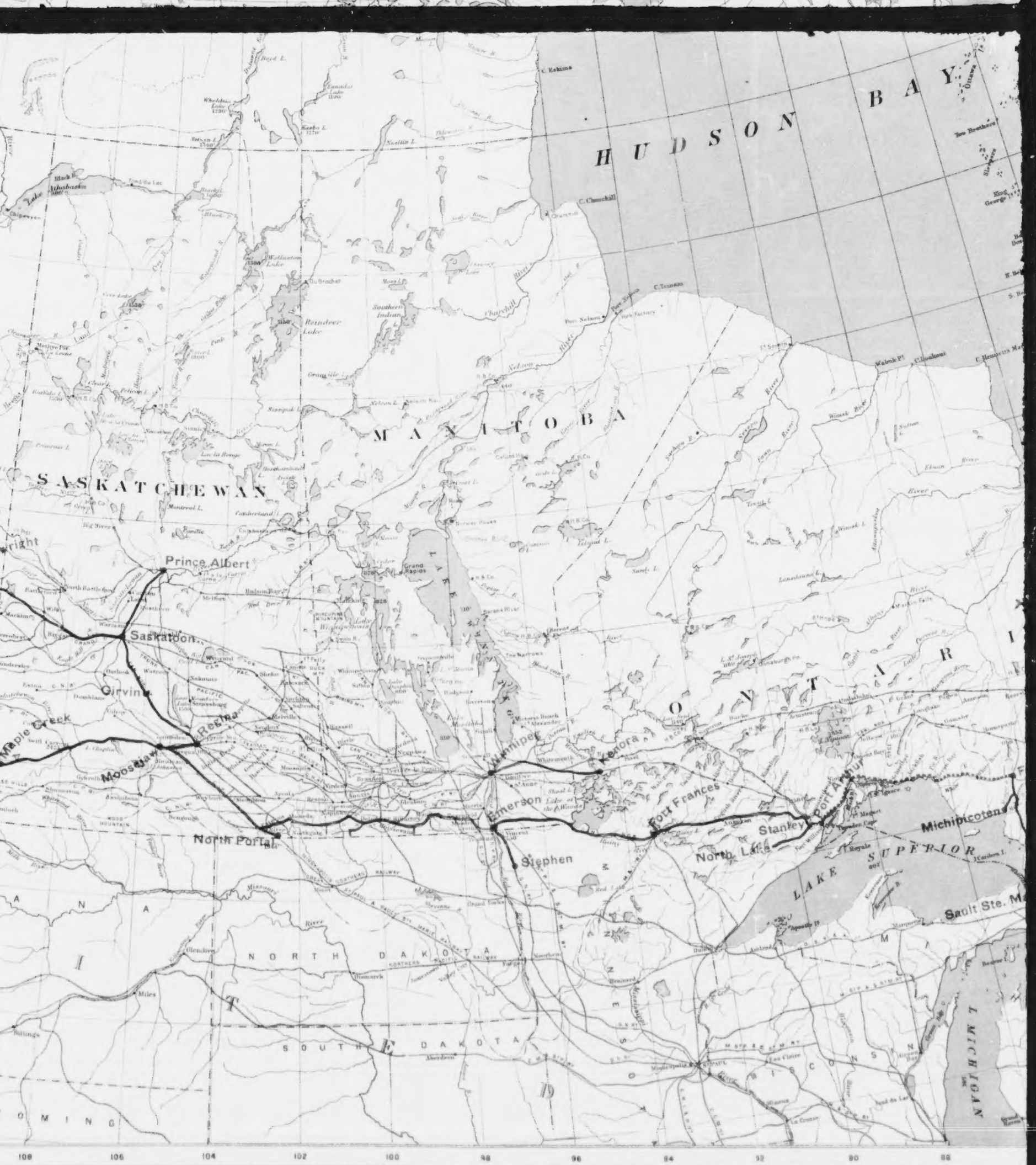
MAP SHOWING  
**PRECISE LEVELLING**  
by the  
**GEODETIC SURVEY OF CANADA**

Accompanying report of F.B. Reid, D.L.S.

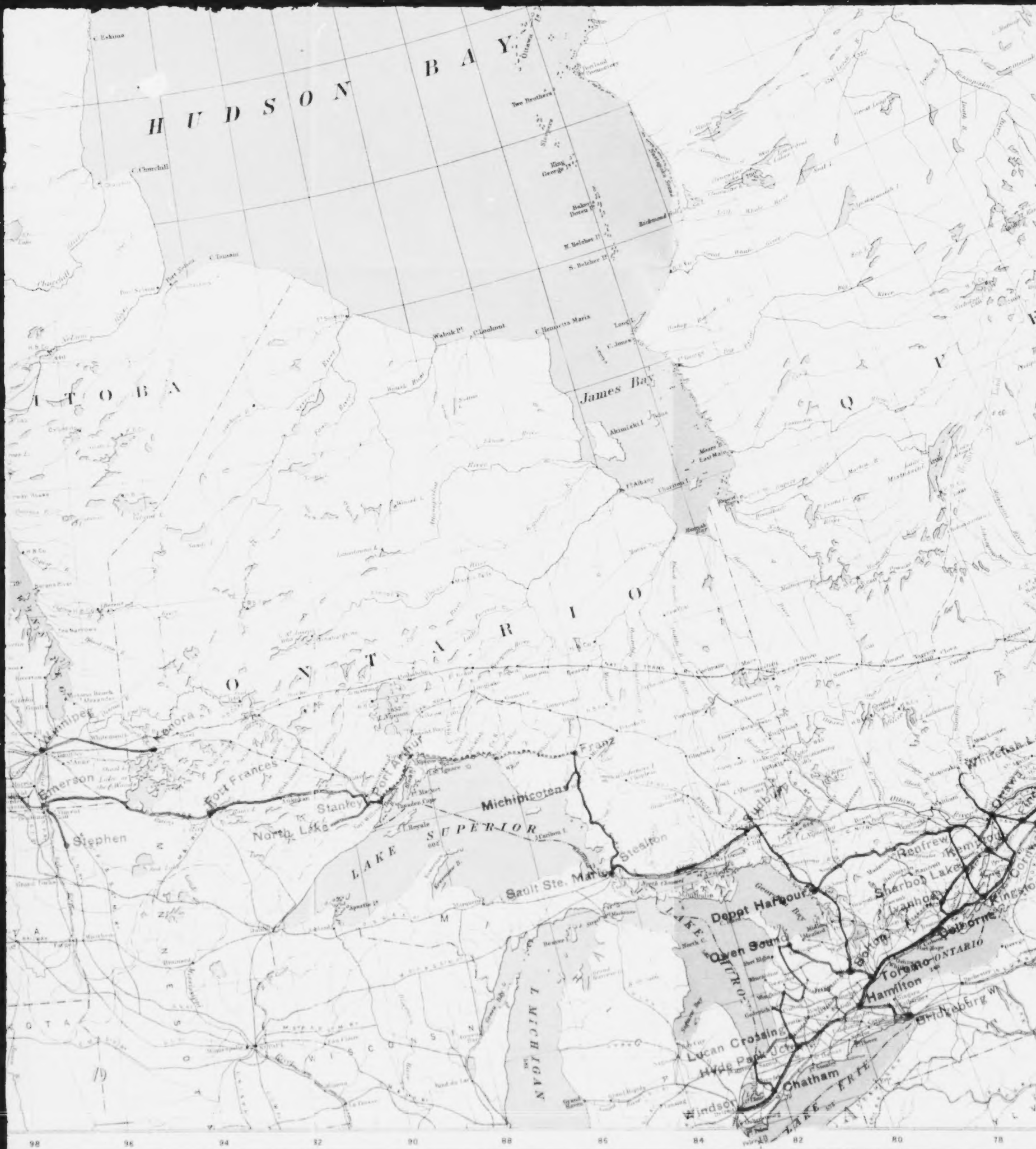
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Precise Levelling, Published.  
Precise Levelling, Not Published.



Precise Levelling, Published.  
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